

NOVEMBER, 1944

JAN 9 '45 C 11 0

THE *Refrigeration* **Industry**

INSTALLATION
MAINTENANCE
MERCHANDISING

AIR CONDITIONING
MACHINERY



Your Subscription to this National Magazine is by Compliment of
RAILWAY & ENGINEERING SPECIALTIES LIMITED

Valves for all refrigeration purposes!

The Weatherhead reputation in the refrigeration field has long been due to the practical engineering with which we endow the many products we make for this industry. Our line of refrigeration valves has been designed and engineered by Weatherhead men who have gone into the field and studied each product in scores of routine uses. As a result, Weatherhead refrigeration valves embody numerous refinements which, coupled with our years of production know-how, make them the first choice of seasoned refrigeration designers and engineers for both domestic and commercial units.



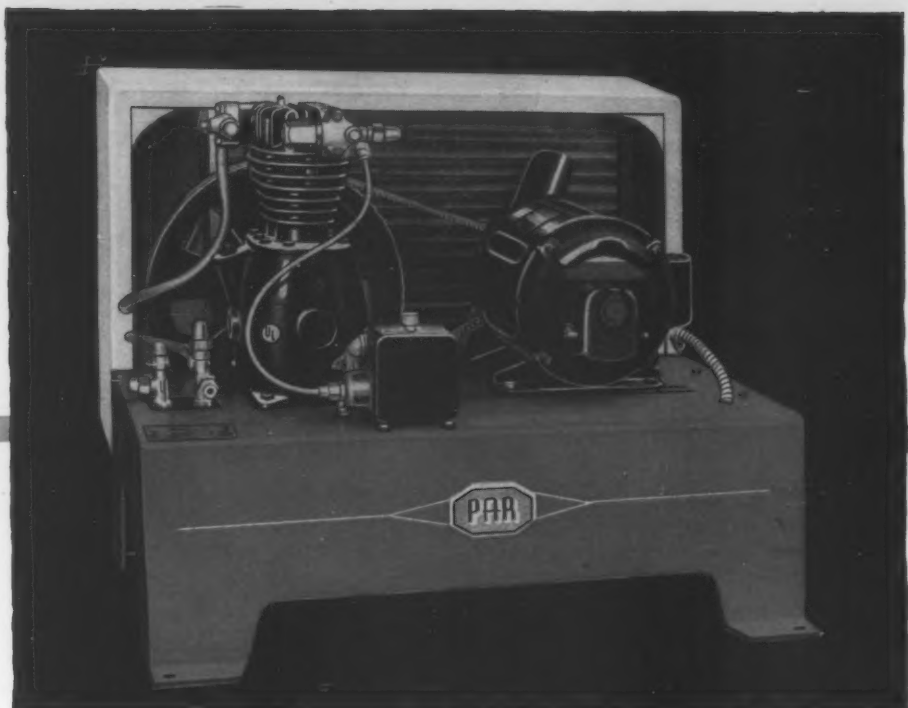
Look Ahead with



Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
*Manufacturers of vital parts for the automotive, aviation,
refrigeration and other key industries.*

Plants: Cleveland, Columbia City, Ind., Los Angeles
Canada—St. Thomas, Ontario



Par Model HA-15

- Here's just the unit for large soda fountains, large dairy coolers, large reach-in or walk-in coolers.
- Its slow speed, fast pump down makes it ideal for years of economical service.
- 1½ H.P. 2 cylinder air cooled with crank type compressor and bull's-eye sight oil gauge.

● Write for illustrated brochure of details.

● BY COMPARISON—YOU'LL BUY PAR.

PAR *Division*

LYNCH

MANUFACTURING
CORPORATION
Defiance, Ohio, U.S.A.

If motor operates without releasing brushes...

REFRIGERATION SERVICE MANUAL

THE BRUNNER MANUAL SAYS:

Brushes should leave commutator in 5 to 10 seconds. Troubles result from delayed operation.

Probable Cause—Test and Remedy

Dirty Commutator. Clean with a piece of fine sandpaper. (Do not use emery.)

Governor mechanism or brushes sticking or brushes worn too short for good contact. See that brushes move freely in slots and that governor mechanism operates freely by hand. Replace worn brushes with new.

Frequency of supply circuit incorrect. Run motor idle. After brushes throw off, speed should be slightly in excess of full-load speed shown on nameplate. An idle speed varying more than 10% from nameplate speed, indicates that motor is being used on a supply frequency for which it is not designed and a different motor will be required.

Low voltage. Keep voltage within 10% of nameplate voltage with switch closed.

Line connection improperly or poorly made. See that contacts are good and that connections correspond with diagram sent with motor.

Incorrect brush setting. Check to see that rocker arm setting corresponds with index mark.

Incorrect adjustment of governor spring. The governor should operate and throw off brushes at approximately 75% of speed stamped on nameplate. Below 65% or over 85% indicates incorrect spring tension.

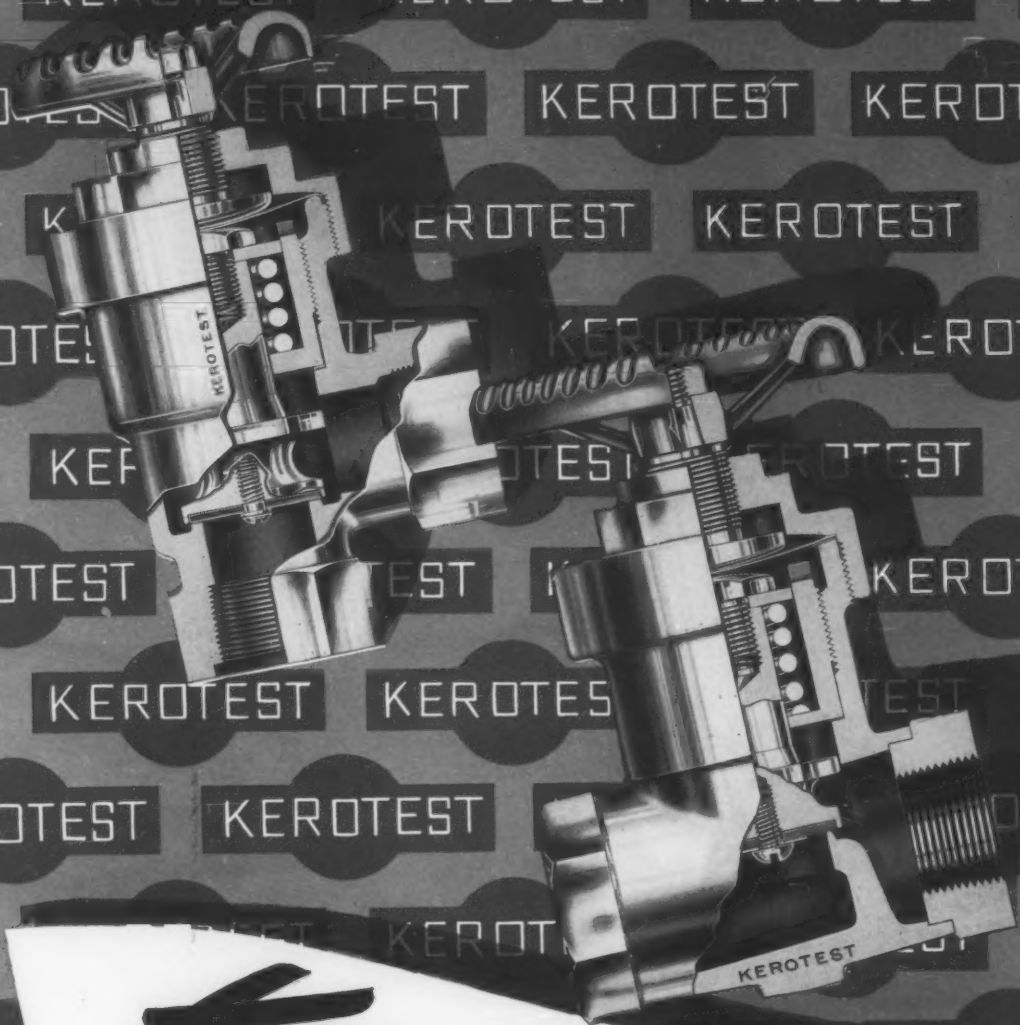
Excessive load. An excessive load may be started and not be carried to and held at full-load speed, which is beyond where the brushes throw off. Tight motor bearings may contribute to overload. This is sometimes indicated by brushes coming off and on commutator.

Shorted stator. Best check is separate wattmeter reading on each of two halves of stator winding. Sometimes shorted coil may be located by fact that one coil feels much hotter than other. Very great increase over normal in magnetic noise may also indicate shorted stator.



Servicing of motors is but one item in your job of securing more efficient performance and longer life from refrigeration units you are called upon to maintain. Your Brunner Manual can help you with ALL items. If you don't have a copy, we'll be glad to furnish one for \$2.50. Write to:

Brunner Manufacturing Company, Utica 1, New York, U. S. A.




Kerotest

The patented* Kerotest Diaphragm Packless Valve is but one of the many important contributions made by Kerotest research and engineering towards more dependable, economical Air Conditioning and Refrigeration. Descriptive bulletins sent on request.

*U.S. Patents Nos. 1,890,505—2,061,028. Swiss Patent No. 181,883. Canada Patent No. 340,598. Listed standard by Underwriters Laboratories.

KEROTEST MANUFACTURING CO.
Valves • Fittings • Accessories


PITTSBURGH, PA.

THE *Refrigeration* INDUSTRY

VOLUME 1, No. 6

NOVEMBER, 1944

The Refrigeration Industry

EDITORIAL AND BUSINESS OFFICES—

812 Huron Road,
Cleveland 15, Ohio

NEW YORK OFFICE—

CHESTER RICE
60 E. 42nd Street,
Room 950
New York 17, New York
Murray Hill 2.0488

CHICAGO OFFICE—

NORMAN J. LOTT
612 N Michigan Avenue,
Room 513
Chicago, Illinois
Superior 2919

EDITOR: T. T. QUINN; As-
sociate Editor: H. K. SMITH,
Jr.; Editorial Advisors: H. S.
McCLOUD, WARREN W.
FARR; Art Director: JAMES
B. HENDERSON; The Staff—
WM. V. LINAS, A. W. KUNTZ,
Production Department; M.
LAJOE, L. N. FLINT, Special
Service Department; E. J.
HEXTER, I. GRABOWSKI, B.
WOLFE, R. OTA, L. CAM-
BELL, Circulation Dept.

Copyright 1944 by REFRIG-
ERATION PUBLICATIONS,
INC., Cleveland, Ohio.
Published Monthly by RE-
FRIGERATION PUBLICA-
TIONS, INC., Cleveland, Ohio.
IRVING B. HEXTER, Pres.
LESTER P. AURBACH, V.Pr.

CONTENTS

THE COVER . . . Soldier-trainees at the Quartermaster Refrigeration School, Camp Lee, Va., study the expansion valve on a German unit, a type they may have to repair later in the field. Official U. S. Army photo.

| | Page |
|--|------|
| USEFUL LITERATURE | |
| New printed material available to readers | 36 |
| BTU'S | |
| The industry's news, views and trends | 13 |
| MOVING IN ON POST-WAR PROFITS | |
| This dealer is ready to merchandise NOW | 14 |
| SNOWSTORM ON WHEELS | |
| Refrigeration takes on a fire fighter's job | 16 |
| ARE YOUR FIGURES BEAUTIFUL BUT DUMB? | |
| Fine figures don't always mean fine profits | 23 |
| TIME SAVING TESTER FOR VALVES AND CONTROLS | |
| Here's a piece of shop equipment you can make | 27 |
| REFRIGERATION TRAINING: G.I. STYLE | |
| How the Army solves its field service problems | 28 |
| HERE'S HOW | |
| The service man's department—how to do it | 30 |
| YOU CAN MAKE 'SEALS PERFORM! | |
| A practical discussion of a common problem | 34 |
| ABOUT PEOPLE | 43 |
| OVER THE COUNTER | |
| Tomorrow's "troubles" may not be so tough | 44 |
| NEW PRODUCTS | |
| New developments in equipment and engineering | 46 |
| THE PRACTICAL REFRIGERATION ENGINEERING MANUAL | |
| Chapter V—Coil selection | 51 |
| THE MARKET PLACE | |
| Classified advertising section | 54 |
| NEW IDEAS | |
| Items of general interest to refrigeration men | 56 |

| | |
|--------------------------------------|----------|
| Subscriptions: By the year | \$2.00 |
| Single copy | 25 cents |
| Extra Postage: Canada | \$1.50 |
| Foreign | 2.00 |

All subscriptions subject to individual acceptance by the publisher.

*More important
than ever*

**-in the war on
moisture**



IMPERIAL *TORPEDO* DEHYDRATOR

(Patent applied for)

NEVER before in the history of the refrigeration industry has the dehydrator been as important an item as today. Since old machines cannot be replaced—they must be repaired. And every time a unit is torn down, it is essential that all possibility of moisture be eliminated—a job for a dehydrator.

For drying out a system the most formidable weapon in this war on moisture is the Imperial Torpedo Dehydrator. This is the dehydrator that was first announced in December, 1940,

and immediately established an amazing performance record.

Here are the features that have set an entirely new standard in dehydrator construction:

- One piece streamlined shell
- Fewer joints — no soft solder — less chance of leakage
- Copper and brass construction
- Packed with "Silica Gel"

Torpedo Dehydrators are built in sizes up to 7 h.p. Available under L-126.

THE IMPERIAL BRASS MFG. CO., 536 So. Racine Ave., Chicago 7, Ill.

IMPERIAL

STRAINERS • DEHYDRATORS • VALVES • FITTINGS • FLOATS • CHARGING LINES
TOOLS FOR CUTTING, FLARING, BENDING, COILING, PINCH-OFF AND SWEDGING



PEERLESS

of **AMERICA** *Inc.*

MARION ★ INDIANA

Refrigeration and Air Conditioning Heat Exchange Equipment

THE FINEST MADE!



WAGNER SHADED-POLE MOTORS. For direct-connected propeller and centrifugal-fan applications requiring very small horsepower, and low starting-torque.



WAGNER REPULSION-START-INDUCTION MOTORS. Ideal for driving condensing units, pumps, and blowers.



WAGNER OPEN-TYPE SQUIRREL-CAGE MOTORS are used on blowers, fans, compressors, pumps, etc.



WAGNER DIRECT-CURRENT MOTORS are built to meet direct-current drive requirements.



WAGNER SPLIT-PHASE MOTORS are applied to unit-heaters, oil-burners, fans and blowers and many other types of equipment.



WAGNER TOTALLY-ENCLOSED MOTORS. Particularly adaptable for unit-heater applications.



WAGNER CAPACITOR-START INDUCTION-RUN MOTORS are particularly adaptable to refrigerators, stokers, and other household appliances.

MOTORS

are but one of several **WAGNER PRODUCTS** serving industry.

Other **WAGNER PRODUCTS:**

AIR BRAKES
BRAKE LINING
HYDRAULIC BRAKES
INDUSTRIAL BRAKES
INDUSTRIAL BRAKE CONTROLS
TACHOGRAPH
(Recording Speedometer)
TRANSFORMERS

Consider **Wagner MOTORS**

**On all Postwar
Refrigeration and Air
Conditioning Equipment**

Foresighted manufacturers are now planning refrigeration and air-conditioning equipment for postwar markets. Dependable motor power must be given careful consideration, and Wagner engineers have designed motors that will do an economical and dependable job on postwar equipment.

The skill and facilities Wagner has gained in years of producing good dependable motors for air-conditioning and refrigeration application are available to you in solving the problems involved in planning and designing your equipment to meet postwar demands.

Send for

these **BULLETINS**

Bulletins MU-182 and MU-183 describe and illustrate the complete line of Wagner motors. Bulletins MU-7B and MU-30B give complete service instructions.



M44-20

Wagner Electric Corporation

ESTABLISHED 1891

6442 Plymouth Avenue, St. Louis 14, Mo., U. S. A.
ELECTRICAL AND AUTOMOTIVE PRODUCTS



HAVE YOU FORGOTTEN ANYTHING?

COMPLETE STOCKS OF THE BEST IN REFRIGERATION AND AIR-CONDITIONING NEEDS IN ONE STOP AT

ALCO JOBBER'S NAME AND PHONE

**SAVE GAS, TIRES
AND TIME with this
handy CHECK LIST**

Another reason it pays to buy
from your ALCO JOBBER

Abrasives
Back Pressure
Regulators

Couplings
Dryers
Drums
Expansion
Valves, Thermo
Evaporators

Evapotrols
Fans
Filters
Fittings
Float Valves
Float Switches
Fuses
Gaskets
Gauges
Hand Valves
Hardware
Heat Exchangers
Humidifiers
Lubricants
Motors
Oil
Outlet Boxes
Packing
Paint
Parts
Pipe
Pulleys

Putty
Receivers
Refrigerants
Regulators,
Evaporator Pres-
sure and Water
Screens
Screws
Seals
Sight Glasses
Solder
Solenoid Valves
Starters
Strainers
Switches
Tape
Thermostatic
Expansion Valves
Thermostats
Tools
Transformers
Trays
Tubing



ALCO VALVE CO.
ST. LOUIS

DESIGNERS AND MANUFACTURERS OF
THERMOSTATIC EXPANSION VALVES;
PRESSURE REGULATING VALVES;
SOLENOID VALVES; FLOAT VALVES.

Here's just what you need—a handy check list (8½ x 11 inches wall card) of refrigeration and air-conditioning needs. Helps you keep stocks complete—saves you gas, tires and time by avoiding extra trips to your jobber for items forgotten or overlooked. A time and money-saving convenience you'll appreciate.

Ask Your Alco Jobber for Your Complimentary Copy



843 Kingsland Ave., St. Louis 5, Mo.



BUY WAR BONDS — AND KEEP THEM

Designers and Manufacturers of Thermostatic
Expansion Valves; Pressure Regulating
Valves; Solenoid Valves; Float Valves.

THE REFRIGERATION INDUSTRY



JOBS ... *when they come home*



Tomorrow is his oyster . . . and YOURS! Scan the progress of the past century. Railroads. Steamships. Telephones. Movies. Airplanes. Radios. Electric lights. But there will be more progress . . . more prosperity . . . in the **NEXT TEN YEARS** than in the hundred which preceded them. Jobs for veterans? Certainly, for those whom jobs will satisfy! But there are **OPPORTUNITIES** to be seized . . . **FORTUNES** to be made . . . by men of intelligence and vision. Refrigeration approaches the dawn of a tremendous tomorrow. Its applications will remake the universe . . . raise living standards . . . pull old habits and customs out by their very roots. Refrigeration can be your "open sesame" to this new world. But only if you **ACT** . . . and act **SOON!** There will be jobs for all . . . but opportunities only for those who see them. Write for our latest Bulletin.

BUSH MANUFACTURING CO.

HARTFORD CONN. · 415 LEXINGTON AVENUE NEW YORK · 549 W. WASHINGTON BLVD. CHICAGO

EXPORT ADDRESS: 13 EAST 40TH STREET, NEW YORK.

CABLE: "ARLAB"

NOVEMBER, 1944

Again Rotary Seals

HAVE ROLLED UP
CONSISTENT GAINS IN SALES



Like the champion football team that smashes through all competition, ROTARY SEALS have this year scored sensational and consistent gains in sales which make them leaders in the industry. Put your bet on ROTARY SEALS for original equipment or replacement units—and they will always come through.

Sixteen years ago, when we first started manufacturing ROTARY SEALS, our goal was the making of a mechanical shaft seal which would win top ranking with customers. The popularity of our product would indicate that this goal has been achieved.



ROTARY SEAL COMPANY

2020 North Larrabee St.

Chicago 14, Illinois

SPORLAN
SELECTIVE CHARGES

G-K-U-Z-O-L-C

THE
**ARMY
AIR FORCE**



both give

PEAK PERFORMANCE

for like each type of army ship, each Sporlan charge has a specific job to do!

SPORLAN
VALVES

*For consultation on any
refrigeration or air conditioning
valve problem, contact*

SPOEHRER-LANGE COMPANY

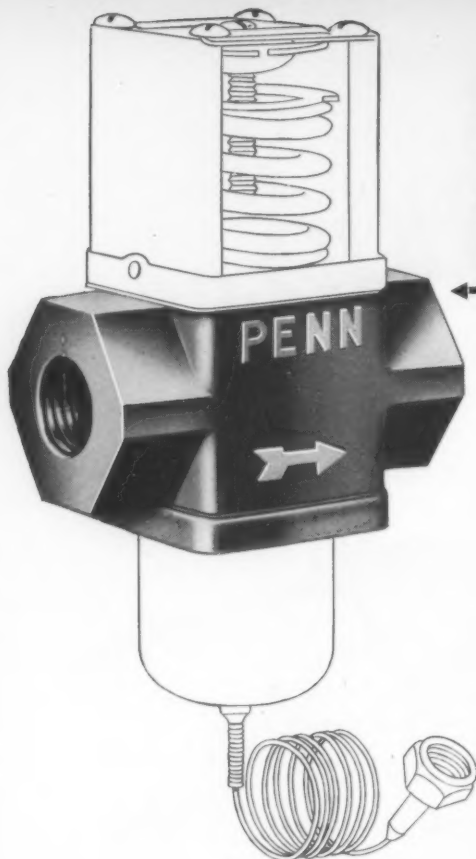
3723 COMMONWEALTH AVENUE • ST. LOUIS 17, MISSOURI

From comfort cooling to low temperature refrigeration, with the wide range of applications in between, no one charge can perform perfectly under all conditions.

Sporlan has developed selective charges G-K-U-Z-O-L-C which are designed to give the best operating characteristics for each class of installation.

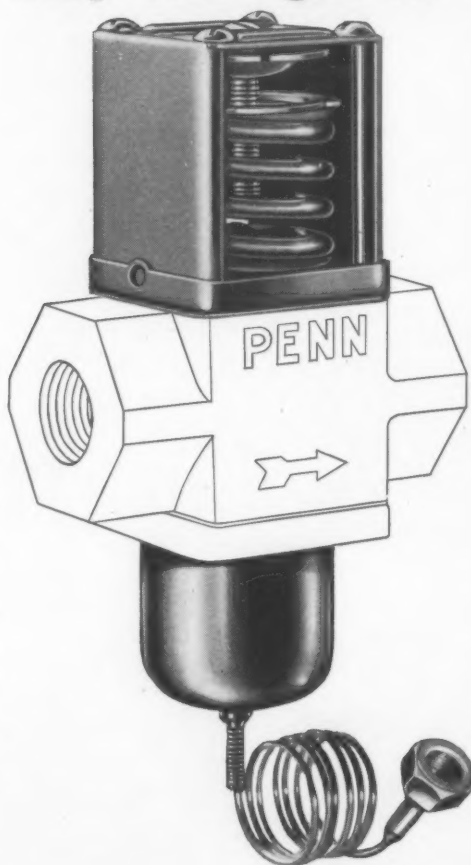
Only by using SPORLAN valves can you be assured of PEAK Performance on EVERY installation.

Sporlan manufactures Solenoid Valves... Solenoid Pilot Controls... Modulating Pilot Controls... Refrigerant Distributors and the only Thermostatic Expansion Valves with Selective Charges.



**Sedimentation,
Corrosion, Rust
are harmless
here**

**...and here
they can't get in**

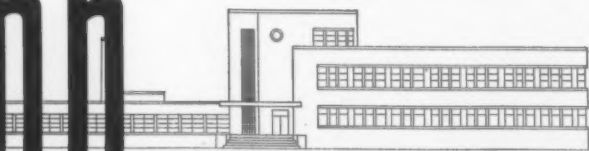


● *Sedimentation, Corrosion, Rust.* They've crippled many a water valve, these three . . . but here's one valve they'll never harm! Known as the PENN Series 246, this new-regulator keeps water right where it belongs—away from sliding parts.

Flowing through the center section, water contacts only the valve seat, valve disc holder, and extension sleeve—all of non-corrosive material—and the rugged casting itself. Above and below, sliding parts are always dry, always free from abrasive deposits.

The valve seat can't stick, nor the range spring turn rusty. Water hammer is eliminated, yet the valve is extremely sensitive to refrigerant head pressure changes. It's available in two styles, flanged and threaded, and in a size to meet every refrigeration need. For free and complete information, ask for Bulletin R-1986. *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U. S. A. In Canada: Powerlite Devices, Ltd., Toronto, Ont.

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

BTU

News • Laws • Trends

LOCKER OUTLOOK

ANY doubts that the frozen food locker storage industry has come of age were dispelled by the attendance and interest at the sixth annual convention and clinic in Columbus in September. Close to 1500 persons attended the three-day meeting, and more than 60 firms exhibited equipment and services for locker operators, including 15 firms in the refrigeration field.

Representatives of a dozen or more non-exhibitors from the industry were on hand, to get a line, if possible, on what the locker field—and competitors—were planning for postwar.

Since 1938, the first year in which national statistics were assembled, the locker industry has grown from about 1250 plants in 33 states to a 1944 total of more than 5500 plants spread over every state in the Union. Five states: Iowa, Wisconsin, Minnesota, Washington, and Illinois—have more than 350 plants each; Iowa tops the list with 580. More than a dozen additional states have over 100 plants each.

Considering the fact that fully three-fourths of today's plants are in communities of less than 5,000 population, and the effect that the home freezer, either as companion or competitor, undoubtedly will have in influencing future trends, the locker field presents a real opportunity for aggressive refrigeration organizations.

TOOLS FOR TRAINEES

ARRANGEMENTS to help newly-trained refrigeration service men obtain needed tools have been worked out by the Electrical and Mechanical Repair Section of the Office of Civilian Requirements, in cooperation with the National Refrigeration Service Council.

There are three steps in the plan:

1. About three months before a class finishes the work, a list of tools that trainees will need and want to buy should be compiled.

2. The instructor or local refrigeration coordinator should take this list to a parts jobber or other source of supply, with a letter of certification stating that the tools are for a certain number of trainees in the community who will finish their training period on a specified date.

3. The jobber then will list the tools on a WPB-

547 application and send it to Washington for processing. Arrangements have been made to give such applications prompt attention and best ratings possible.

DISPLAY CASES

A REFRIGERATED display case program calling for the production of 8,000 units for the period from October 1 this year to September, 1945 has been approved by WPB, subject to manpower clearance. This figure represents about 20 per cent of 1940 production.

Programs for ice cream dispensing cabinets, soda fountains, frozen foods dispensing cabinets and freezers also are under consideration for the first quarter of 1945.

PARTS BUILD-UP

A RECOMMENDATION that manufacturers of mechanical refrigerators be permitted to build up inventories of parts until civilian production can be resumed was made recently to the War Production Board by the Domestic Refrigerator Labor Advisory Committee.

Provision for increased production of mechanical refrigerator parts, similar to that recently made for washing machine repair parts, is being planned by WPB, and problems that might retard future production of these parts are being studied. Already, WPB said, there is a 50 per cent improvement over 1943 manufacture.

Committee members also recommended that the possibility of forming consumer goods "production pools" should be studied, so that, by pooling facilities and manpower of a number of plants, a limited number of refrigerators might be produced before reconversion.

MARKETS FOR NOW

LARGE quantities of refrigeration equipment are required by the food processing industry as replacement material to keep these activities going, the War Food Administration has reported after a recent survey of essential requirements in the industry. Here's a breakdown of estimated needs in various fields:

Meat processing, \$2,012,370—including chill room and aging room refrigeration, cold storage rooms (both low temperature and normal), and quick-freezing equipment.

Continued on page 38

What do you know about the influence of quick freezing on your business?

- What do increased retail sales of frozen foods mean to refrigeration men?
- How can you, as a refrigeration man, get a piece of the locker plant business?
- Is a boom in home freezers only a post-war mirage?

Don't miss "Let's Look at the Frozen Food Business," an authoritative series of articles beginning in the December issue of THE REFRIGERATION INDUSTRY.

MOVING IN ON POST-WAR PROFITS

How do you go about preparing for merchandising of new refrigeration equipment when none is yet available? Here's what one service company is doing.

ONE way to get set for post-war sales, figured Bill Mercier and Tom Spalding, of Mercier & Spalding, Inc., Detroit, is to move in right now. So move they did, literally.

From the shop where for thirteen years the predecessor firm, Mercier & Clark, Inc., had operated as a refrigeration and air conditioning sales and service company, the new organization moved to new, larger quarters in a building they purchased at a location more central to the city's substantial northwestern residential districts.

With ample store and shop space, the firm's new home has a fifty foot frontage on a main residential thoroughfare, and provides room for adequate display of the complete lines of refrigeration and air conditioning equipment they will handle as soon as merchandise is once more available. As remodeling goes forward, the present display space will be more than doubled by knocking out a wall into an adjoining store.

Mercier & Spalding are already holders of a franchise for Sherer-Gillett store equipment, and intend to take on a representative line of domestic refrigerators. Right now they're looking around for a good proposition in low temperature home



Service cylinders chilled in a refrigerator (top) fill quickly with liquid at low pressure. Tom Spalding (left) plans the day's schedule with a pair of Mercier & Spalding service men before they start out.

storage and home freezer cabinets. As Bill Mercier sees it, there'll be a good market for home cabinets post-war, particularly in homes where higher incomes and larger families will make possible realization of all the advantages of home units.

Although they were pioneers in establishing monthly contract service in Detroit, the firm was forced to terminate all contracts in August, 1943, because of material shortages.

George S. Clark, a refrigeration engineer who, with Bill Mercier, organized the original corporation, withdrew not long ago to take a position with the University of Michigan as an experimental engineer. Mr. Clark established one of the first refrigeration schools in Detroit.

When first OPA ceilings on service and repair charges were published, it was obvious a first class domestic refrigerator overhaul could not be performed at the prices set. So with the help of Raymond Shock, secretary of the Detroit Refrigeration Contractors Association, Mercier & Clark petitioned the OPA Washington office for a regulation revision.

As a result a new directive was issued, allowing separate pricing of

cabinet work and work on condensing and evaporative units. Today 22 service men are kept busy in and out of the new shop and throughout the city, and servicing of domestic refrigerators is an important part of the company's war-time business.

Ready-made Customer List

When it comes to the actual selling of post-war merchandise, Mercier & Spalding are going to make use of the customer list built up during years of reliable servicing. R. T. Spalding, son of Tom Spalding, has joined the firm and will devote his time exclusively to sales.

But there'll be no need for cold canvassing. When you get right down to it, they feel, the service man is a "natural" as far as sales are concerned. First of all, Bill Mercier points out, the service man has the confidence of the customer. The man with the tool box gets the first tip on a possible prospect for new equipment—sometimes even before the customer knows anything about it!

And in cases where the service man himself does not have the precise knack of selling, he at least lays the ground work, makes it easy for a salesman to close the deal. Yet, this

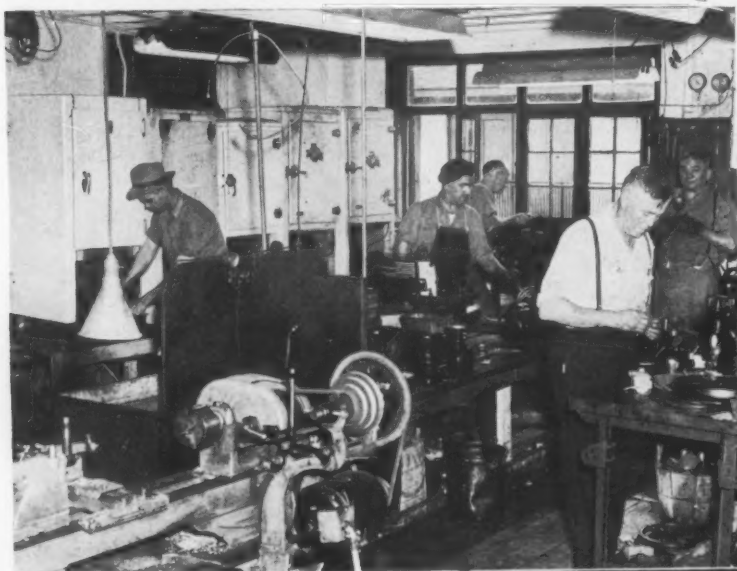
firm reminds us, heretofore operators of a service organization have developed a lot of hot leads for new merchandise—and then have lost the sales simply because they weren't set up to handle retail business! The business went to some appliance dealer who, oftener than not, was more interested in selling a piece of equipment than he was in adding a satisfied customer to his service list.

Until new refrigeration equipment is available for their post-war sales program, Mercier & Spalding intend to maintain at a high peak of performance the service organization upon which the company's reputation has been built.

The new shop is completely equipped to handle repair of compressors, motors, all types of coils, and repair of refrigerator cabinets. Much of the present service work still is in the commercial field, and it is likely that monthly service contracts again will be sought when the labor and material shortages ease somewhat.

To conserve gas, time and labor, service men are briefed each morning as they plan the day's calls. Either Bill Mercier or Tom Spalding goes over each man's schedule before he leaves the shop, and men in the field check in by phone before moving from one job to another.

Part of the success of Mercier & Spalding's service business stems from the important fact that some of their service men have been with the firm for many years. It is these veteran service men who will bring in the bacon when post-war selling begins.



General view of the shop shows repairmen at work on some domestic units. All work benches are equipped with evacuation lines to central collector.

Right, repairman spraypaints compressor bodies. All repaired equipment is cleaned and painted to give the job customer-satisfying eye appeal.



Snowstorm ON WHEELS

Refrigeration takes on fire fighter's job, controlling CO₂ "blanket" for plane blazes. Here's another field in which the refrigeration man plays an important part

REFRIGERATION, foe of heat in all its forms, has been enlisted in the fight against that most dangerous form of heat, fire. Developed especially to "blitz" crash fires at military airports, a new fire truck literally blankets these blazes with tons of carbon dioxide "snow" and vapor, saving fliers' lives and salvaging precious equipment.

And keeping the cargo of carbon dioxide at a temperature of 0° F. and a pressure of approximately 300 p. s. i. is a one-horsepower Brunner condensing unit, the heart of the fire-fighting system.

Recently at important military airfields throughout the United States, specially invited groups of army and navy officers, government officials, and civilians have seen simulated airplane crash-fires extinguished in as little as 20 seconds.

Not only has the blaze itself been extinguished in 20 seconds, but usually within one minute the mass of hot metal and blazing gasoline had been safely cooled to a point below re-ignition temperature. Though information on experience with actual crash fires is not available at this time, it appears likely that this development will represent an important step toward safer flying.

To experienced fire fighters, the significance of such performance lies in the fact that the extremely severe conditions imposed place fires of this kind among the toughest of all to fight successfully.

The extinguishing equipment used at these demonstrations was the six-wheel drive Cardox airport fire truck that can speed at close to 50 miles per hour to the scene of a crash and release three tons of carbon dioxide, if necessary, onto the blazing plane in approximately one minute.

Cardox unit utilizes liquid carbon

dioxide, maintained at the low temperature of 0°F., and discharged at an extremely high rate into the heart of the crash fire, so that the fire is "cooled out" quickly and completely.

As the liquid carbon dioxide is discharged from its controlled temperature and pressure into the air, it immediately becomes part CO₂ snow (dry ice particles) at minus 110° F.,

and part very cold CO₂ vapor. The gasoline and the fire zone are immediately flooded with a gas that crowds out the oxygen necessary for burning. Vapor and "snow" rob the fire of its necessary "heat of combustion".

Carbon dioxide in the truck is stored in a single, large, mechanically refrigerated and insulated pressure

Continued on page 36



Top, left: Dumping CO₂ onto blaze under simulated crash conditions. Top, a one h.p. Brunner condensing unit keeps pressure down. Above, side view of truck. Boom nozzle alone can discharge 2500 lbs. per minute.

Chemically Inert

...NON-REACTIVE



PROCESSED ESPECIALLY FOR THE DEHYDRATION OF REFRIGERANTS

Davison's Silica Gel will not attack metals or alloys. This advantage, *plus* the fact that Davison's Silica Gel adsorbs and *holds* acids that cause corrosion gives you complete freedom from hazards that affect the life and performance of the unit.

Other advantages of Davison's Silica Gel: 1—Acts instantly; 2—Its maximum capacity is unaffected by oil; 3—It will not cake nor powder; 4—Prevents channelling : : *maximum pore surface and volume is presented to refrigerant at all times.*

Specify Davison's Silica Gel . . . in bulk for refill and in factory-charged dehydrators . . . from your jobber.

THE DAVISON CHEMICAL CORPORATION
Progress through Chemistry **D** BALTIMORE-3, MD.

Canadian exclusive sales agents for DAVISON'S SILICA GEL: CANADIAN INDUSTRIES LIMITED, General Chemicals Division



DON'T WORRY

If you're waiting for the Mills Compressors you have on order, don't worry. You're sure going to get them, and they'll be as good or better than ever.

MILLS INDUSTRIES, INCORPORATED

4100 Fullerton Avenue, Chicago 39, Illinois



Check THESE FEATURES!

Four sizes available—providing capacities from 1½ tons to 6 tons Freon, 3 to 11 tons Methyl Chloride.

Furnished with or without external equalizer.

New style forged union connections with interchangeable tail pipes.

PLUS—all the other outstanding design and construction features of the "Dura-ram" line, including "gas charging," stainless steel diaphragms and hermitically sealed construction.

NORMAL CAPACITY—TONS REFRIGERATION

| | FREON 12 | FREON 22 | METHYL CHLORIDE |
|--------------|----------|----------|-----------------|
| 1.6 ton size | 1.6 | 2.6 | 3.0 |
| 3 ton size | 3.0 | 4.5 | 5.3 |
| 4.5 ton size | 4.5 | 7.0 | 8.0 |
| 6 ton size | 6.0 | 9.6 | 11.0 |

This valve rounds out the Dura-ram line to provide capacities in small steps from ½ to 20 tons Freon—1 to 36 tons Methyl.

Write for further information.



USE "Detroit" valves for
outstanding performance and
complete satisfaction.

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT 8, MICHIGAN

Canadian Representatives—Railway and Engineering Specialties Ltd., Montreal, Toronto, Winnipeg

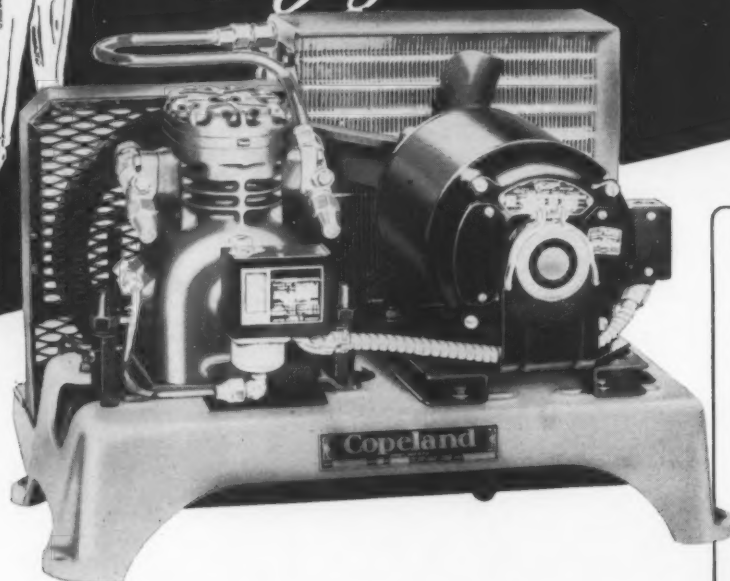
Division of **AMERICAN RADIATOR & Standard Sanitary** CORPORATION

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators



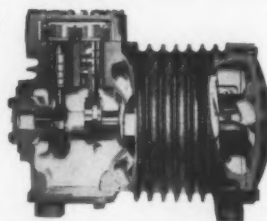
"Your Customers Deserve this Long Lasting

Copeland *Efficiency"*

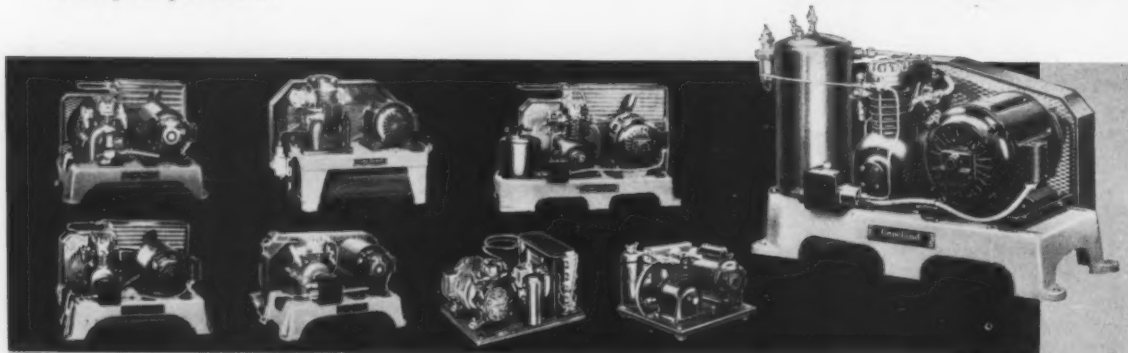


COPELAMETIC

... combines all the good features of welded-in hermetics and open type units. No belt—no seal—no manual oiling. Service is reduced to a minimum and if required can be handled in the field! Not available now, but ready for production when released.

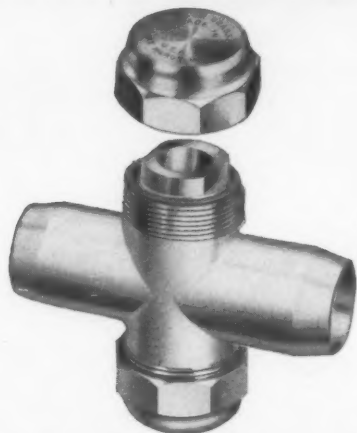


Don't let any refrigeration unit problem bother you. In the complete Copeland line you will find just the size and type of unit you need to give your customers the best and most efficient service. We are exerting every effort to be of help to you NOW!



COPELAND REFRIGERATION CORPORATION · SIDNEY · OHIO

MUELLER BRASS CO. LIQUID INDICATORS WILL NOT LEAK



DOUBLE PORT LIQUID INDICATOR

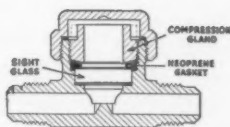


**WITH
SEAL CAP**



The improved design of our liquid indicators is effective assurance against refrigerant leakage around the sight glass. The sight glass is sealed into the forged brass body by a heavy Neoprene gasket which, in turn, is compressed by a packing gland, which forces the pliable gasket along the sides of the glass and produces a perfect seal.

Mueller Brass Co. Liquid Indicators are made in a complete range of styles and sizes. The



seal cap and open port type may be installed where light conditions are favorable. Where the light is poor, we recommend the use of our double port liquid indicators

illustrated here. By flashing a light through one port, the exact condition of the refrigerant may be determined through the other port.

The new design of the compression gland permits the use of standard wrenches for tightening.

NOTE: All models of Mueller Brass Co. filters and line strainers may be obtained with female flare connections on one end. This makes it possible to assemble any desired filter to a liquid indicator for installation in the liquid line of the system.

MUELLER BRASS CO.

PORT HURON, MICHIGAN



USE A "Y" STRAINER for Large Capacity and Long Service

Due to its features of design the Henry "Y" Strainer not only gives complete protection to condensing unit and control equipment against scale and foreign matter that may be present in the system, but it also permits easy servicing with a minimum of interruption to plant operation.

The Henry "Y" Strainer, like other Henry products, has become the choice of the Army, Navy, Maritime Commission and those who serve the refrigeration and air conditioning industry in time of peace as well as in time of war.

7 Reasons Why You'll Like It Best!

- 1 Light in weight — due to its tubular construction.
- 2 The strainer screen can be easily and quickly cleaned without removing the strainer from the line.
- 3 "Wave-Flow" design results in negligible pressure drop.
- 4 Cleaning seldom necessary because of large screen area.
- 5 Internal baffle prevents injury to the heavily reinforced monel screen. In this connection it is well to remember that suction velocities may exceed 5,000 feet per minute.
- 6 Patented forged steel clean-out flange is distortion-proof, making a tongue and groove anchored-gasket joint with strainer body.
- 7 Strainer is of welded steel construction. Rustproofed. Available with copper sockets for O.D. tubing and steel F.P.T. connections for iron pipe.

Available in $\frac{3}{8}$ " to 3 $\frac{1}{2}$ " O.D.S. sizes and in 1" to 3" F.P.T. sizes with screen area ranging from 23 to 175 square inches.

FOR SUCTION OR LIQUID LINES



The Henry "Y" Strainer when used in suction line service will not trap oil if the strainer is installed on its side as shown. 50-mesh screen is recommended for suction lines.

For liquid line service the Henry "Y" Strainer can be installed either in a horizontal or vertical position. 100-mesh screen is recommended for liquid lines.

Why the Patented Henry Flange Is Distortion Proof



Strains due to uneven or excessive tightening of bolts are absorbed in the recessed area (A) and cannot be transferred to the flange gasket face (B) made up of the inner flange rim and the strainer housing to which the flange is welded. Lip on outer flange rim (C) acts as a "stop" to prevent excessive drawing up of bolts. Gasket is located in recessed area (D). Flange makes tongue and groove anchored-gasket joint with strainer.

HENRY VALVE Company

3260 West Grand Ave.
Chicago 51, Illinois

SOLD BY LEADING
JOBBER EVERYWHERE

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

Fine figures can fool you when it comes to estimating returns on your invested capital. Dealers can set up their business for sound returns. Study this article carefully and learn how.

By Fred Merish

FROM field studies among refrigeration dealers and maintenance men, we estimate that 80 per cent do not use the return on capital investment as a yardstick of their managerial efficiency, only the profit on sales. If they earn a reasonable percentage on sales, they are satisfied, yet the ultimate profitability of a business is measured by the return on invested capital.

etc., thereby managing to get the same percentage of net as in 1942, but 6 per cent of \$20,000 is \$1,200, and his net worth or capital investment is now \$31,500, because it has been increased by the \$1,500 net profit earned in 1942.

The \$1,200 net profit computed on \$31,500 investment gives only 4

been doing business on a more conservative investment has the edge on those who are over-capitalized today. Study these figures and learn why.

A had 1942 volume of..\$25,000
He earned a net profit
of 4%

A's net profit in 1942..\$ 1,000

A had capital investment
of\$30,000

\$1,000 return on capital
investment 3 1/3%

B had 1942 volume of..\$25,000

ARE YOUR

The capital invested in your business is the original investment, augmented with profits earned each year or diminished by losses deducted. The net profit on sales in dollars computed on this investment gives the percentage of return.

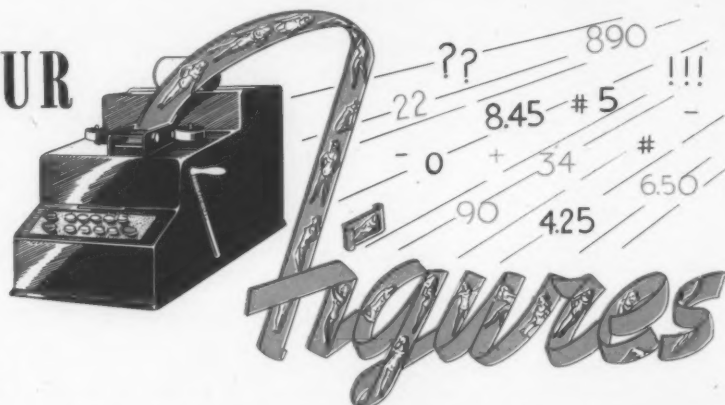
Neglecting the importance of earnings on investment has always been hazardous. Its computation is now a "must," because with war restrictions and high taxation, every angle of operation must be checked and rechecked to make sure that loss-leaks are eliminated and profits kept at maximum.

Where war restrictions, shortages and high taxation are depressing profits, the general remedy is to cut expense to offset this trend, but even the businessman who is able to cut his expense in ratio to sales equal to the average before the war should not be too cocky about it unless the earnings on investment are satisfactory.

The investment may be high and the profit in dollars may show unsatisfactory earnings on investment even though the percentage of profit on sales is up to average.

For example, a dealer or maintenance man may have had a volume of \$25,000 in 1942 and earned 6 per cent net profit, or \$1,500.

His net worth was \$30,000, so the \$1,500 net profit on sales gave him 5 per cent profit on capital invested. In 1943, his volume was cut to \$20,000, he effects economies by drawing less salary himself, eliminating little loss-leaks here and there,



BEAUTIFUL BUT DUMB?

per cent return, 1 per cent less than in 1942, a decrease of 20 per cent when comparing the profit on investment for the two years.

If this downward trend in sales continues, even though the net profit on sales remains the same, this dealer or maintenance man's earnings on investment will decrease further—and it is this percentage, the return on the capital invested in your business—that is a better gage of your managerial efficiency and financial stability than the net profit on sales.

Dealers and maintenance men who are maintaining or increasing volume at this time are not exempt from keeping a close check on investment profit because in the postwar period, should volume drop eventually, they will experience similar problems.

Watch Capitalization

Businessmen in this field who are over-capitalized had better watch their step carefully from now on. The dealer or maintenance man who has

He earned net profit
of 4%

B's net profit for 1942..\$ 1,000

B had capital investment
of\$20,000
\$1,000 return on capital
investment 5%

B is the better businessman because he makes his invested dollars work harder than A and this is the ultimate yardstick of business efficiency, even in normal times, and likewise in the postwar period, whichever way volume goes.

In some cases reviewed in a recent field study, the investment carried water, which gave the businessman an erroneous conception of his earnings. If your net worth is inflated, you may be earning a bigger return than you figure but the water therein obscures the fact.

Conversely, if the net worth is deflated and shows less on the bal-

ance sheet than it actually is, you may be earning a lower return than you figure. It is important, therefore, that you assure the accuracy of this figure before computing the return on investment.

This problem will project itself into the postwar period, when heavy demand, long bottled up, will necessitate expansion and modernization for many refrigeration dealers and servicemen. Suppose A, with a volume of \$25,000, modernizes and increases facilities in the postwar period at an investment of \$5,000 and that he increased sales that year by \$5,000, earning 5 per cent net. Sales would be \$30,000 and net profit \$1,500, which, on an investment of \$25,000, would be 6 per cent earnings. B invests \$5,000 in a similar manner and increases sales from \$25,000 to \$30,000, also earning 5 per cent net profit, or \$1,500. His return on a \$20,000 capital investment is 7.5 per cent, so that he would pocket 25 per cent more on his invested dollars, although he would get the same amount in sales dollars as A.

This indicates that the profit on modernization depends to some extent on your capital investment and explains why some businessmen in bygone years complained that modernization did not produce the results expected, whereas other businessmen reported excellent results.



It is obvious that the refrigeration dealer or maintenance man who depends entirely upon the net profits on sales to tell him whether he is profiting on modernization or other monies sunk in his business will often get an erroneous answer.

In 1943, we analyzed certain case histories on this subject and present

a few of the highlights. One businessman, A, earned 4.7 per cent on sales and 6 per cent on investment, another, B, earned 2.8 per cent on sales and 7.4 per cent on his investment, another, C, earned 4.2 on sales and jumped to 11.9 per cent on capital investment.

Figured by the usual yardstick—profit on sales—it would seem as though A did the best managerial job, but this is not so because the ratio of profit to net worth or capital invested in the business is the ultimate measure of profitability—not the profit on sales, although this should be considered. C was the best businessman. He got more out of his invested dollars than A or B.

DEEPFREEZE DISTRIBUTORS HEAR POSTWAR PLANS

During the first postwar unlimited production year, sales of more than 150,000 Deepfreeze units were promised by distributors who attended a sales convention recently conducted at Nippersink Lodge, Genoa City, Wis.

Speakers included Tom Beck, president of Crowell-Collier Publishing Co.; Willard Morrison, Deepfreeze president, who unveiled several postwar models; J. B. Replogle, Deepfreeze chief engineer, and L. E. Jacques, production superintendent, Motor Products Corp.

Howard Roberts, sales manager, outlined the postwar merchandising

program; Lynn Werner, advertising manager, and Walter Seiler, of Cramer-Krasselt Co., discussed postwar promotional plans.

POSTWAR MARKET

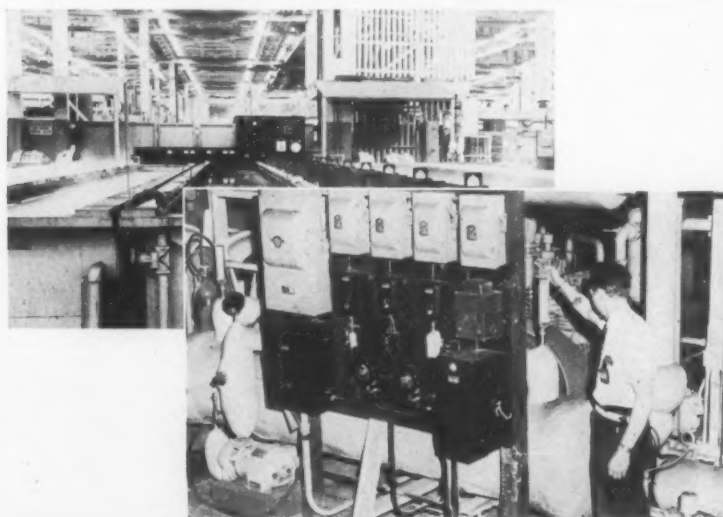
The deferred demand for mechanical refrigerators was set at 5,200,000 units by Sumner H. Slichter, Harvard economist, in a recent address before 200 regional chairmen of the Committee for Economic Development.

Postwar demand for refrigerators and other durable goods is likely for a year or more to test the productive capacity of U. S. industry, Mr. Slichter said. With 57 million people working 7.5 per cent fewer hours, the output of goods would fall short by a small margin of meeting the probable demand, he declared.

Demand for consumer durable goods will be at the rate of more than 14 billion dollars a year, he predicted, plus perhaps as much as 4 billion dollars a year spent for four years to fill the backlog created by war scarcities.

NAME CHANGE

Pacific Railway Equipment Co., Los Angeles, Calif., has formally changed its corporate name to Preco, Inc., announces C. T. Hill, president. The new name is a derivation of its former corporate name, by which it was principally known to many of its customers. No other changes have been made, however, in management, address, or personnel.



Maintenance of a constant temperature in these chromic acid tanks is achieved through Carrier equipment as seen in the huge Douglas Chicago plant. Tanks have a capacity of 9,000 gallons. Metals to be treated are immersed in the tanks from an electrically operated crane. Employee checks temperature of vat holding chromic acid. Section of refrigerating installation may be seen in picture.

...about an old familiar figure that's taken on new significance

TO ENGINEERS and contractors in refrigeration and air conditioning fields, the origin—and present-day significance—of the G-E Scotch Giant have a new importance.

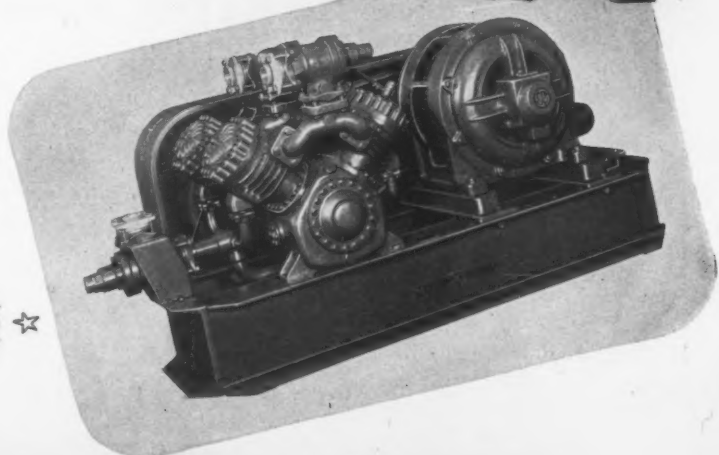
The Scotch Giant is not just an artist's idea. He came into being because he typified so accurately the features that have made "Scotch Giant" Condensing Units the leaders wherever cold is needed. These features are *ruggedness, reliability, thriftiness*.

"Scotch Giants" are *rugged* because they are built from carefully selected materials, utilizing advanced manufacturing techniques to assure long life under severe conditions.

Their *reliability* comes from such features as dependable lubrication . . . hard core gaskets and balanced-pressure shaft seals for lasting protection against loss of refrigerant or oil . . . multiple V-belt drives.

Their *thriftiness* results from the high thermodynamic efficiency of the G-E Compressor . . . the high electrical efficiency of the G-E Motor . . . the high condensing capacity of the G-E Condenser.

For full details on these features of "Scotch Giant" Condensing Units, write to: General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 49711 Bloomfield, N. J.



☆ BUY . . . and hold . . . WAR BONDS ☆

GENERAL  ELECTRIC

Hear the General Electric Radio Programs: The "G-E ALL-GIRL ORCHESTRA," Sundays 10 p. m., EWT, NBC . . . "THE WORLD TODAY" News, Every Weekday, 6:45 p. m., EWT, CBS

NOVEMBER, 1944

25

BEAUTIFUL *SPASAVER*



Complete Line
of Heat Exchange
Equipment

Evaporative Condensers

Water Coolers

Liquid Coolers



THE FIRST AND ONLY FACTORY OF
ITS KIND IN THE WEST WITH COM-
PLETE FACILITIES FOR ENGINEERING,
DESIGNING, MANUFACTURING HEAT
EXCHANGE EQUIPMENT.

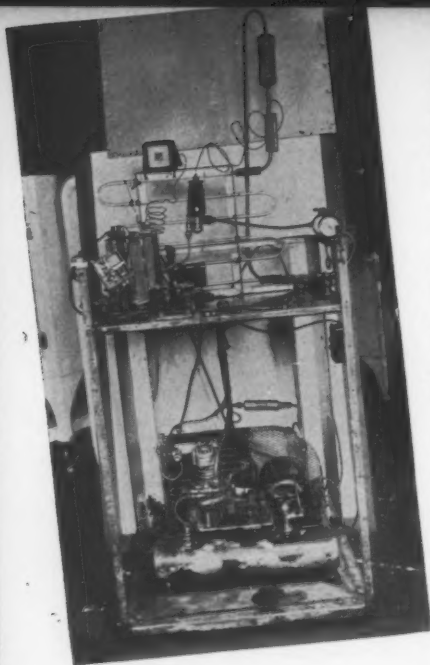
... brings you greater PRIDE and PROFIT

Finished in white deluxe enamel and streamlined for beauty, Spasaver is efficient, dependable and economical, too.

This modern horizontal cooler for cold rooms and refrigerators is manufactured in 10 sizes. All operate with minimum noise and require practically no servicing. It means more pride and satisfaction in service, more profit from any angle.

Write today for complete informational catalog.

drayer-hanson INC.
Since 1910 738 E. Pico St., Los Angeles 21, California



the compressor in the cabinet base. We found, after several attempts, that pure gum rubber worked very satisfactorily in connecting the glass tube at the end of the coil to the copper refrigerant line.

We ran our liquid line from receiver to a two-valve manifold, with one valve for the glass coil and one for the control coil. From the liquid manifold valve we used a short piece of sweeping tubing, so that expansion valves of various sizes and shapes could be connected to it.

We also installed a hand shut-off valve between the expansion valve and coil, so that in changing valves there would be no chance of air or moisture entering the system. To an upright loop in the suction line from

Overall view of testing unit, showing location of various integral parts of the system.

TIME-SAVING TESTER for Valves and Controls

By R. M. Saville

Rash-Saville-Crawford
Cincinnati, Ohio



ON NUMEROUS occasions in our shop work we found the need for some simple method of testing expansion valves and thermostat controls quickly and thoroughly. Frequently a service man would condemn an expansion valve for improper operation, only to have it shown, when the unit was returned to the factory, that the trouble was due to a moisture condition and not to a defect in the valve mechanism.

Also, when controls were hard to obtain, we often found it necessary to change the original factory setting to enable us to use the control on a job requiring a different setting.

With this in mind, we set out to make a piece of shop equipment that would take care of both of these operations. After experimenting with various devices for use as a refrigerant coil, we finally had a neon sign company make one for us. Using a household refrigerator cabinet frame, we mounted the coil on the back of the upper part of the cabinet, with

A REFRIGERATION INDUSTRY MONEY MAKER

the coil, we soldered three pieces of $\frac{1}{2}$ -inch tubing about 6 inches long. These tubes, soldered shut at the bottom and partially filled with glycerin, were for location of the expansion valve bulb from the thermometer.

A two-valve manifold was installed in the suction line controlling each of the two refrigerated coils, and a $\frac{1}{2}$ by $\frac{1}{4}$ -inch tee, with compound gauge attached, in the suction line between the glass coil and the shut-off valve.

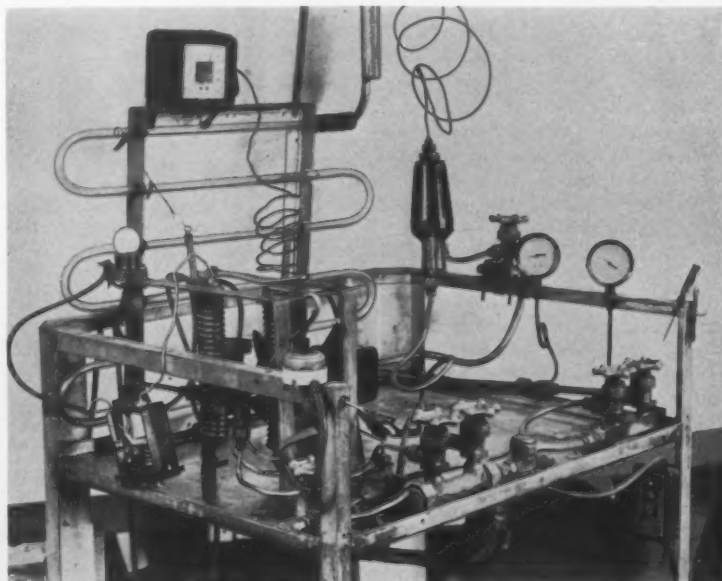
We installed a $\frac{1}{4}$ -inch tee in the head service valve gauge port of the compressor, and ran a $\frac{1}{4}$ -inch line to the pressure gauge, with another $\frac{1}{4}$ -inch line, in which was installed a shut-off valve, teed into the coil for testing. Our thought was that we could use the warm gas to heat up this control testing coil.

However, we discovered later that we could get better results by using a fan to blow air onto this coil, as the gas heated up the coil so rapidly that we were unable to obtain an accurate temperature reading.

For our control testing device, we used three pieces of $\frac{1}{2}$ -inch tubing approximately 12 inches long, soldering the bottom end closed and the

Continued on page 48

Close-up of the testing device, with expansion valve and control under test. Note the ingenious arrangement of coils and manifolds and location of gauges. Light at left signals when control contacts close.





Three refrigeration school trainees have removed compressor head in order to inspect valve plates.

**By M/Sgt.
William Burgard, QMC**

Instructor, Refrigeration Specialist Course
ASTFC, Camp Lee, Va.

WHEN our Army moved overseas and bases were established all over the world a new problem presented itself. More refrigeration equipment was needed, new conditions had to be met: storage of food in climates ranging from hot and humid to extreme cold—from the Aleutians to the jungles of India, deserts of Africa and the humid islands of the South Pacific. Ice plant equipment was needed for medical and troop use, refrigerating warehouses for the storage of perishables, and refrigerated mobile units to travel with our fast-moving fighters.

Most of the stationary equipment was installed by civilian engineers, but maintenance and operation was left to the Army. Trained men were needed and a training program was set up.

Refrigeration in the field was something new in the Army, so it meant starting from scratch. First, the classification and assignment department interviewed men, and those who were believed to be experienced in refrigeration were assigned to refrigeration units. Some of these were sent overseas immediately; others were sent to schools for training. In some instances, however, the equipment was not available at the time they finished their schooling, and some of these men were shifted to other fields where there was an immediate need for trained mechanics.

Because of their versatility, refrigeration men are desired by every branch of the service. These men found very little trouble getting acclimated. When the equipment was ready for operation by the Army, there again was a shortage of experienced men. As a result, a number of men from other fields were sent to school and trained. It is impossible to turn out an efficient refrigeration man from inexperienced material in

an eight-weeks' course, but by proper application these men were able to qualify as semi-skilled workers.

When the men were put to work in the field, it was found that in a surprisingly short time they developed into skilled refrigeration mechanics. This was because only men of the highest mechanical ability, determined by various aptitude tests, were selected for schooling in refrigeration.

More than 2000 men have passed through the Quartermaster Refrigeration Specialist Course at Camp Lee's Army Service Forces training center.

REFRIGERATION

G. I. Style

These men have traveled to the far corners of the earth, and have come in contact with some very unusual operating problems.

Reports have been received from Iran that head pressures are greatly above normal, that some temperatures are higher than 120° F. and ambient temperatures well above the 100° mark.

In Africa, many strange units have been found and operated—French and English, as well as American. Men from this theater have had to redesign systems using refrigeration equipment of several nations. Men who have just returned from this theater describe interesting designs—particularly those using two and three stage compressors in low temperature work. Many of the difficulties experienced were caused by failure of the gas engine used to operate the compressor, the result of excessive carbon deposits in the head and valves. This condition was corrected by operating the engine at a higher speed, burning the excessive carbon.

In the British West Indies, one of the biggest problems involved water used for the condenser cooling and ice making. Water had to be collected during rainfall and stored in huge underground water reservoirs. Sea water was first used after a distilling process, but because of the inability of the distiller to remove all impurities, the condensers became corroded to such an extent that constant cleaning and replacement of parts was required.

This problem was also found in the South American theater, where Freon was used as a refrigerant. Conden-



TRAINING...

Know-how learned the hard way will make Army-trained men a post-war asset to the industry

Top, instructor explains functioning of captured German unit

Right, removing cold plate from refrigeration trailer during field work

Below, students adjust portable Freon units at the Camp Lee School

sers blew up because of salt deposits, with the result that impellers of the circulating pumps and evaporative condensers had to be repaired and replaced at very short intervals. Installation of carbon impellers and improvement of the distilling equipment helped to correct the problem of corrosion in this area. Average ambient temperature was approximately 100° F. throughout the year, and the relative humidity approximately 80%. The condensing units in this area were from 5 to 7½ horsepower, and were used largely for general storage purposes. One of the greatest problems was the lack of condenser cleaning tools.

The Canal Zone theater presented a different problem. There the refrigeration men are required to cover a 1000-mile radius, and to operate and maintain ice plants and storage warehouses. Both Freon and ammonia are used as the refrigerant for ice making, storage, ice cream freezing and water cooling. Year 'round ambient

Continued on page 40



"Let's share our knowledge—exchange our experiences"



THE SERVICE MAN'S DEPARTMENT

Storage Suggestions. Under present conditions, with people moving from place to place and families of military inductees placing their furniture in storage, service organizations are frequently asked how to properly store an electric refrigerator. Here are some suggestions as to how this should be done.

The refrigerator should be thoroughly cleaned and dried inside and out, with an application of a good wax applied to the exterior after it has been cleaned. Wax may also be applied to the shelving, to protect the finish.

Leave the Door Open

In storing a refrigerator, leave the door open, block the door so that air can circulate inside, and then tape the door in place. The tape should not be applied directly to the painted finish but should be wrapped around the cabinet, backed by a sheet of wax paper. Put the wax paper on first, then the tape over the paper.

The door should be left open, because after a refrigerator has been in operation in a home, the insulation contains about three times as much moisture as it did when the cabinet was originally assembled. The refrigerator stored with the door closed will generate an odor, which will permeate the insulation and make the cabinet almost impossible to use without replacing the insulation when it is put into service again. Blocking the door open also preserves the life of the rubber door gaskets.

On all refrigerators that are provided with shut-off valves, it is desirable to pump the refrigerant back into the condenser, to eliminate any

This section of
The Refrigeration Industry
is edited by
Warren W. Farr
Refrigeration Maintenance
Corporation, Cleveland, Ohio

undue strains on the low side due to high temperatures. If possible, store the refrigerator in a dry and nearly consistent temperature as humidity will break down the finish and rust the steel parts. A refrigerator properly stored can be returned to service in as good condition as it was when put away.

Use the Telephone. You can use the telephone to build service business, but there is a right way and a wrong way to do it. You can't call



up and ask, "Need any service?" You must plan your telephone canvass. In a planned canvass, you know what

you are going to say—and you say just that, and nothing else. You don't try to sell your company, or the expert service which you render, or the value of the service job on the refrigerator in question. Instead, try to sell a service call. That is all you can do.

For instance, you can try to sell a housewife on the idea of having a service man do an inspection and cleaning job on the refrigerator. In such a case your telephone canvass should be designed solely to set a time when your service man can make the call. Here's how such a call can be handled. In speaking to the prospect, use these exact words:

"Mrs. Doe, this week we have a special on refrigerator inspection and cleaning. If this service has not been performed on your refrigerator recently, you can cut your current costs and prolong the life of your unit by performing this work. Our man will be in your neighborhood tomorrow afternoon. Could he inspect and clean your refrigerator at that time?"

Write these words on a small card, and put the card where it can be easily read as you use the telephone. If you will say these words exactly as you have written them on the card, you will get appointments for clean-up service. Try it out when service slacks off. Avoid, if possible, a lengthy conversation with the customer. All you want is to make a date for the service man to come into this home and look at the refrigerator. That is a big enough job for a telephone conversation.

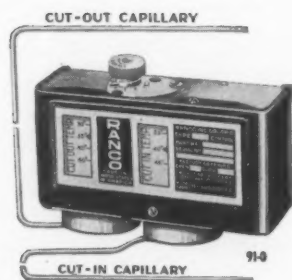
Remember: Good telephone habits



"Joe certainly thinks well of his Ranco Jobber."

SERVICE MAN JOE has found from experience—especially in these times of shortages, substitutions and adaptations—that his Ranco Jobber is a mighty fine, helpful person.

He, and YOU, can rely on your Ranco Jobber for advice and assistance in the selection of Ranco Domestic and Commercial Refrigeration Controls. Naturally, the production of controls is limited at this time. In some instances you may find it necessary to substitute. When this is the case, you may rest assured that your Ranco Jobber will suggest something easily adaptable. And you know, when you select Ranco, that it is a precision instrument, sturdily made, dependable and accurate.



**MAKE A HABIT OF WORKING
WITH YOUR RANCO JOBBER.**

Ranco Inc.
COLUMBUS 1, OHIO

make friends. A telephone call is just as important as a personal visit, if you handle it correctly. Here are three important points it will pay you to keep in mind in your telephone canvassing work:

1. Hold the mouthpiece directly in front of and close to the lips. If the person you're calling can't hear what you're saying, he'll be annoyed—and your sales efforts will be wasted.

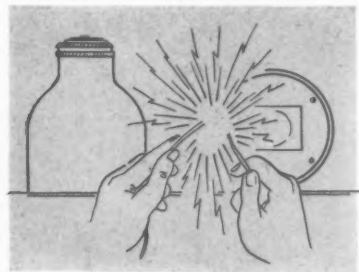
2. Speak in your natural conversational voice. Raising your voice doesn't help it carry better. If your lips are close to the mouthpiece, it isn't necessary to speak loudly. Try to get a mental picture of the person you're calling—it will help you to speak as naturally as though you were seeing him face-to-face.

3. Pronounce words clearly and distinctly. Try to get a tone of personal interest into your voice. If you're really "sold" on the job you're doing, a natural personal interest will be reflected in your voice.

DO IT THE SAFE WAY: Use a Series Test Light.

"Whoops—Not that way." The service man who's causing all the sparks in the sketch below just didn't take the trouble to test to find out "which wire connects to where."

Testing the circuit would have averted blown fuse, burned terminals,



and possible eye injury to himself, as well as the possibility of losing the customer's confidence in his ability to do a good repair job.

The smart service man will use a series test light instead of flashing hot lines across terminals and leads to determine the correct place of connection. Three-wire cable to cabinet top can easily be tested to find which line connects to common, to light switch, or to thermostat switch contacts if you use the series test light hook-up shown in Figure 1 in the following description.

A simple, but very handy combination of easily available electrical parts will help the service man to

make the same test right at the job, just as surely and satisfactorily as he could if he had the appliance in his shop on his work bench. Such a testing device is particularly welcome when bulky and immovable jobs are encountered.

Figure 1 shows the arrangement for continuity test. Be sure to have the appliance to be tested disconnected from the line before using

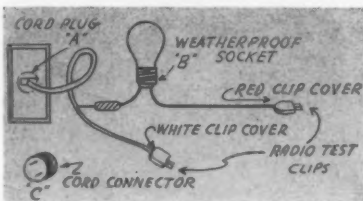


Fig. 1—Series test light hook-up.

light in series with electric outlet. If this outlet is too far from the job, use an extension to bring power where it is needed. If power supply happens to be 220 volts, use a 220-volt lamp. By selecting the size of the lamp, the current flow through the circuit can be regulated to fit the type of circuit to be tested.

For testing, a flashlight bulb or 10-watt lamp in series with 110 volts will prove satisfactory. For locating a ground, broken wire, or broken insulation, use a large wattage lamp; or even better, a heater unit of high wattage, so that enough current will flow to point out spot of break, but not enough to blow fuse or cause other damage.

Also, if you need power supply for testing motors or solenoid coils, a screw plug fuse in series with the direct line will make it safe to clip on full power supply. When in damp places, or when working on appliances where the frame is grounded, be certain that the "hot" side of the line is in series with the weatherproof socket, and the straight-through line connected to the neutral or grounded side of the power supply. When using 220-volt or three-phase supply for testing, it is necessary to connect a weatherproof socket in series with both test leads.

To use as common test socket, plug cord plug "A" into cord connector "C" which has jumper from one terminal to the other, thus closing the circuit at the cord plug and safely insulating that part of the test cord. The test clips are now free for testing. Remember to use a 220-volt

lamp when testing a 220-volt circuit.

To Get power for working light, clip on to supply, remembering to use proper voltage lamp. Clip one side to grounded pipe or frame, and the other side to any "hot" terminal on switch to get light when working in unhandy location. You can also screw plug body into socket, and take power away with extension cord to location where it is needed.

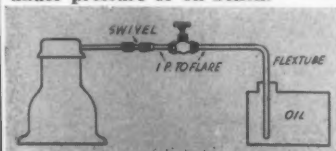
J. F. Schall, Northampton, Pa.

Stop Freon Waste. Incomplete removal of "Freon" from cylinders can result in losses as high as 6 per cent of the total contents of the drum. Today, the importance of completely emptying these cylinders cannot be over-emphasized. In order to remove the total charge of "Freon" from a cylinder, it is necessary to also remove the vapors after all of the liquid refrigerant has been drawn from the container.

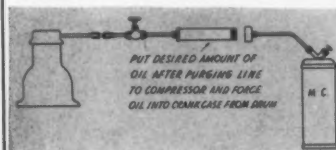
This can best be done by connecting the vapor-laden cylinder to the suction side of a compressor, and evacuating the cylinder to a 28 or 29-inch vacuum for a period of 20

I do it this way...

Here are a couple of ideas I have found very convenient in introducing oil into compressors, under pressure or on bench.



1. Use a length of transparent plastic tubing as oil line. If less than a full container is needed, insert tubing to desired depth and when tubing is uncovered air will follow oil and stop cock may be closed.



2. Use a screw cap dryer case for oil container, or make one out of pipe and caps.

R. R. Sherfy, Sunbury, Ohio

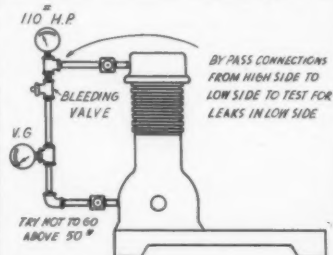
to 30 minutes. The vapor removed from the cylinder is compressed and condensed, and discharged into a storage container or service drum.

Extreme care should be taken in selecting a compressor for this work that will operate at a low vacuum without slugging a lot of oil into the "Freon" refrigerant that is being condensed. Unless this precaution is observed, it will be impossible to determine which percentage of the total weight is refrigerant and which is oil. It would also be possible, if the oil is not kept separate from the refrigerant, to charge the wrong grade or an excess quantity of oil into a refrigerating system.

I do it this way...

Here is a service tip that has been of help to me in finding of small leaks in low side coils or any small leak in the low side. Most of the time a small leak will not show up under the average running pressure, but when the machine is shut down for cleaning out or other reasons it loses its gas and we get a service call.

I put a tee on the high side service valve and attach a high pressure gage and then a line from this tee to a small service valve that goes to



the low side service valve where I put a compound gage. Then we can regulate the pressure on the low side. I use as little pressure as needed to find a leak.

Open the high side valve wide and regulate the pressure with the "bleeder valve" going to the low side. I seldom have to go over 50 lbs. Machine should be stopped when testing. Most leaks will show up before pressure reaches 50 lbs. Over this, you may start other leaks in soldered joints or at the seal. This has saved me many return calls.

Arthur James, Brockton, Mass.



KEY TO A BILLION DOLLAR HOME 'FREEZER' MARKET

M & E FRACTIONAL H. P. UNITS DESIGNED FOR LOW, COMPACT MOUNTING AREAS

M&E was one of the first to design and manufacture the so-called "package" unit for small, self-contained cabinets. These units packed extra power and capacity in a comparatively small overall size. ★ If you are going after the domestic or farm market for freezer or storage cabinet business we would like to talk to you now in advance of our actual production. The M&E Compressor line will be complete and versatile with integral units from 1/6 to 5 H. P.

★ A WORD TO JOBBERS, DISTRIBUTORS, MANUFACTURERS AGENTS, CABINET MANUFACTURERS.

Although we are not ready to make delivery it is not too early to discuss post war merchandising. Our plans are still flexible and we invite correspondence from responsible individuals and organizations interested in the sale or use of M&E refrigeration products.

MERCHANT & EVANS COMPANY

GENERAL OFFICES

2035 WASHINGTON AVENUE

Philadelphia 46, Pa.



Plant at Lancaster, Pa.

You can make

SEALS

PERFORM !



Here's a down-to-earth discussion of a problem which every refrigeration man should understand

By Edward A. Wenk

UNTIL the development of the metallic bellows, most refrigeration compressors used a stuffing box. The shaft, passing through the stuffing box, was packed with an asbestos composition in the form of string, formed rings, or split rings. Some of the early sulphur dioxide compressors used these packing rings. In any case, no matter what packing mate-

much difficulty was encountered and seal trouble is as old as refrigeration.

The advent of low-pressure refrigerants, such as sulphur dioxide, methyl chloride, and others, plus the crankcase vacuums encountered on such applications, as well as the need for a less troublesome device, led to the adoption of a metallic bellows seal.

Seal Must Run True

There can be nothing hit-or-miss about a seal; either it holds, or it does not. Few servicemen realize

the correct pressure. It must be provided with access to the oil in the compressor. If the oil level is low in the compressor, or the seal chamber does not receive oil, due to the oil hole being plugged or too small, or does not remain filled with oil due to the overflow hole being too large, trouble is almost sure to result.

Types of Seals

There have been many forms and types of seals, and space does not permit of more than a general discussion. The principle is always the same. In some cases the bellows revolves with the shaft, and has bearing on a stationary end-plate. In others, the seal is held fast on the crankcase by a retaining plate, and the nose has bearing on the shoulder of the revolving shaft. Many materials have been used for seal faces. Generally it does not pay to try to repair a seal, unless it has a ferrous metal part and a non-ferrous metal counter-part as bearing surfaces. One of the first types of seal used is known as the unbalanced type. Typical construction is illustrated in Fig. 1. While this seal was very satisfactory, the spring pressure was high. The spring was located between the bellows and the shaft, and in some cases, washers were provided so that the spring pressure could be varied.

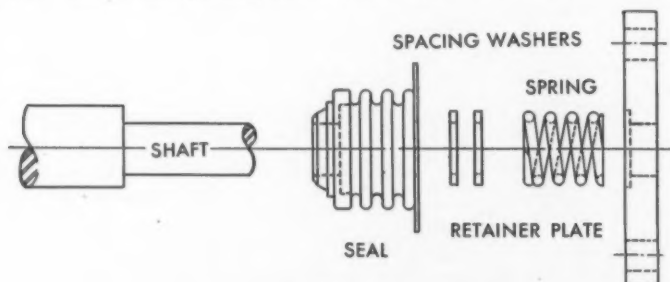


Figure 1—Unbalanced type seal.

rial was used, it was necessary to provide a gland to force the packing against the shaft. About every possible method was used to keep the gland under a certain pressure, but

that a bent shaft, a wobbling fly wheel, or a too-tight belt can make even a mechanically-perfect seal leak.

A seal must run true. The spring must be ground square and be of

The Balanced Type

This seal has been largely superseded by the balanced type, an example of which is shown in Fig. 2. In this form, the spring is located

outside of the bellows. This makes possible the use of the smaller, more flexible bellows, and requires less spring pressure. Most seals of this type have only one spring, but there are instances where three or more matched helical compression springs are spaced evenly around the bellows.

Factory Replacements

There are also factory replacement seals made for field service by several condensing unit manufacturers, and intended for use on specific machines. Typical construction is shown in Fig. 3. These generally use a shoulder facing on the shaft. Between the shoulder-face and the replacement-facing is placed a synthetic rubber ring. These seals are satisfactory when this ring fits very snugly, or is fastened to the shaft in some way. However, if the seal face sticks to the replacement-facing as sometimes happens, the replacement-facing revolves on the synthetic rubber ring, and leakage may result.

Diaphragm Seal

The diaphragm seal is shown in Fig. 4. In this form, the seal-face was mounted on a diaphragm composed of two thicknesses of copper or bronze. Spring tension on the other end of the shaft forced the shaft-face against the seal-face.

New Replacement Seal

Fig. 5 shows a replacement seal which is coming into considerable use. This type does not use the shaft between the fly wheel end and the seal-face as a bearing surface, and in consequence can be used even on rough or pitted shafts. It consists of a synthetic rubber ring, a seal-face revolving with the shaft, and a sleeve, bronzed-faced, and free to center itself. The sleeve is held in a synthetic rubber gasket mounted within the end plate.

Rotary Seal

There is also the rotary type seal, shown in Fig. 6 and 6a. Fig. 6 illustrates an earlier design, and Fig. 6a shows a current unit assembled in the seal housing of the compressor. In this type, the seal revolves with

Continued on page 39

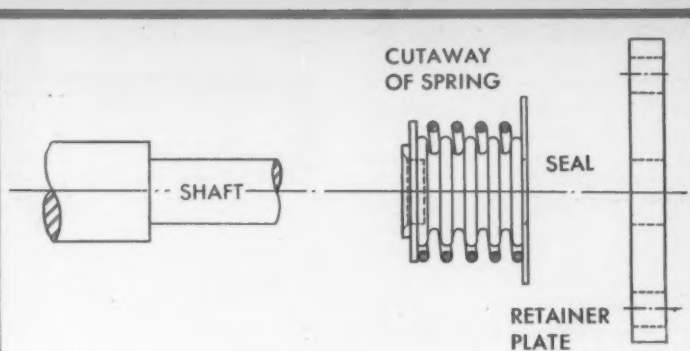


Figure 2—Balanced type seal.

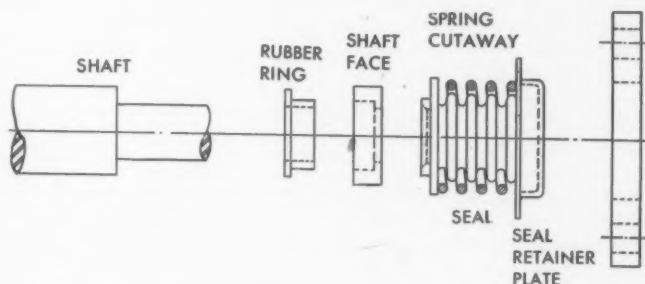


Figure 3—Factory replacement seal.

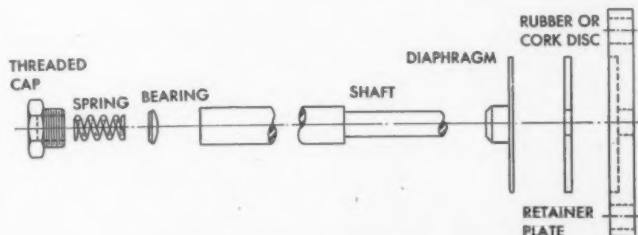


Figure 4—Diaphragm type seal.

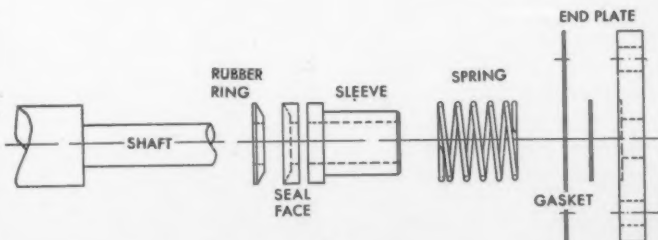


Figure 5—Replacement Type seal.

SNOWSTORM ON WHEELS

Continued from page 16

vessel at a temperature of approximately 0° F. and the resulting, relatively low pressure of 300 pounds per square inch.

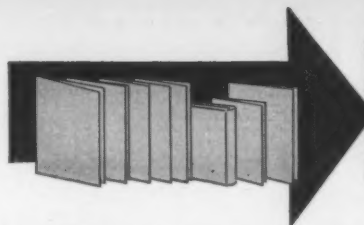
In the refrigeration system a one horsepower Brunner condensing unit is used, utilizing Freon as the refrigerant. When the truck is not in use electrical power for the motor is supplied by a drop cord which is plugged into the truck. Driving the truck away to the scene of the fire automatically disconnects the cord.

The refrigeration unit is entirely automatic in its operation, with the power supply to the motor controlled by a tank pressure switch. When the tank pressure rises to 300 pounds per square inch, this switch closes and starts the motor. When the carbon dioxide has been refrigerated to the extent that tank pressure is reduced to 290 pounds per square inch, the tank pressure switch opens and the compressor stops. Through temperature control, pressure is thus constantly maintained within the range of 290 to 300 pounds per square inch.

The front nozzle, mounted just ahead of the truck radiator, and a linear ground-sweep nozzle—each with a capacity of 1250 pounds of carbon dioxide per minute—are discharged directly into the heart of the fire. Shielded behind this cooling screen of inert carbon dioxide, the truck can safely approach the fire.

Released at the rate of approximately 2,500 pounds per minute from the 15-foot long boom nozzle mounted on the cab of the truck, carbon dioxide vapor and "snow" knock down heat and flame and engulf the fire zone. By controls on the instrument panel within the cab, the boom and front nozzles are moved up or down, to right or left, for most effective application of the mass discharge of carbon dioxide. Discharge of both these nozzles, as well as the linear nozzle, is controlled from the cab.

Two hose lines, each 100 feet long, with 1½-inch nozzles of 750 pounds of carbon dioxide per minute capacity, are brought into action to give extreme flexibility of application, as well as to apply the maximum amount of carbon dioxide in the shortest period of time. Two ⅝-inch hose lines fitted with bayonet type nozzles may also be used to pierce and flood plane compartments with carbon dioxide.



The publications featured on this page were written by experts. They are **FREE** publications. To obtain these write to **THE REFRIGERATION INDUSTRY**, 812 Huron Road, Cleveland, 15, Ohio. If there is some delay in receiving the material requested, please understand that this is due to our operating with a minimum staff. We shall put through all requests as rapidly as possible.

67—Time Switch . . . An engineering bulletin describing its 700 Series seven-day calendar type time switch, useful in cold rooms, locker plants, similar applications. Issued by Paragon Electric Co.

68—Solenoid Valve . . . A bulletin (403) describing its Model 270 pilot operated solenoid valve, and giving service data. Issued by Automatic Products Co.

69—Fittings . . . A catalog listing more than a thousand items and sizes of fittings, return bends, tubular parts for refrigeration equipment. Issued by Northern Indiana Brass Co.

70—Refrigerants . . . A technical booklet describing the various properties of its sulphur dioxide and methyl chloride. Issued by Ansul Chemical Co.

71—Compressors . . . A new catalog illustrating and outlining features of its compressor and fin type coil products. Issued by Merchant & Evans Co.

72—Motor Parts . . . A 136-page handbook listing renewal parts for fans, motors and controllers, brushes, bearings and commutators. Issued by Complete-Reading Electric Co.

73—Home Freezer . . . A four-page folder illustrating and giving specifications of the Model F-9 home freezer which it has developed for post-war marketing. Issued by Amana Society.

74—Dehydrators . . . A catalog describing its filters and driers, issued by Mueller Brass Co.

75—Unit Coolers . . . A bulletin by Bush Mfg. Co. describing its unit coolers, coils and other products for refrigeration.

76—Conditioner . . . Product bulletins listing sizes, construction details, and capacities of its "Comfortaire" conditioner for commercial and industrial use. Issued by American Coils Co.

77—Motors . . . Two bulletins (MU-182 and MU-183) containing general description and construction features of its single-phase and polyphase motors, issued by Wagner Electric Corp.

78—Cold Plates . . . A 12-page bulletin describing its "Serpentine" design cold plates for locker plant, cold storage room, freeze room and similar uses, and for cabinet and fountain conversions. Issued by Kold-Hold Mfg. Co.

79—Locker Plants . . . An eight-page presentation on "Locker Plants in Wartime", issued by Carrier Corp.

80—Insulation . . . Two bulletins, the first illustrating uses and properties of "Zer-O-Cel" insulation, and the second detailing methods of installation in locker plants. Issued by National Gypsum Co.

81—Condensing Units . . . A 24-page publication illustrating and listing design features of its "Scotch Giant" units for all types of commercial applications, issued by General Electric Co.

82—Postwar Freezer Market . . . "A Study of the Farm and Home Freezer Market after the War", discussing sales opportunities in the low-temperature field. Issued by Servel, Inc.

83—Circuit Breaker . . . Information about its new 100-ampere "De-ion" circuit breaker. Available from Westinghouse Electric & Mfg. Co.

MAIL THIS COUPON FOR FREE LITERATURE

Refrigeration Industry, 812 Huron Road, Cleveland 15, O.

I should like a copy of the literature listed below:

| | | | |
|-----------|-----------|-----------|-----------|
| NO. _____ | NO. _____ | NO. _____ | NO. _____ |
| NO. _____ | NO. _____ | NO. _____ | NO. _____ |
| NO. _____ | NO. _____ | NO. _____ | NO. _____ |
| NO. _____ | NO. _____ | NO. _____ | NO. _____ |

NAME _____ POSITION _____

FIRM _____

MAILING ADDRESS _____ ☐ HOME ☐ BUSINESS

CITY _____ ZONE _____ STATE _____

11-44

"The Record is... Trouble-Free" The Record

"The Record is... Trouble-Free"

"The Record is... Trouble-Free"

For 30 years Kelvinator has consistently maintained an outstanding record of trouble-free performance. Kelvinator Condensing Units, engineered and built entirely by Kelvinator craftsmen, can be depended upon for economy and years of uninterrupted service.

"The Record is... Trouble-Free"

"The Record is... Trouble-Free"

"The Record is... Trouble-Free"

Kelvinator

condensing units

SEALED • OPEN

"The Record is... Trouble-Free" The Record

"The Record is... Trouble-Free" "The Record is... Trouble-Free"



For your home — Remember Kelvinator Refrigerators, Electric Ranges, Water Heaters and Home Freezers... they, too, are famous for trouble-free performance.

Bread and other bakery products, \$1,262,580—including dough refrigeration, water cooling, cold storage rooms, and walk-in coolers.

Dairy processing, \$5,586,870—including milk coolers, water coolers, walk-in coolers, cold storage rooms, and low temperature equipment.

Fish production and storage, \$616,916—covering quick-freezing equipment and cold storage rooms.

Egg processing, \$312,930—including cooling equipment for candling and breaking rooms, egg-drying refrigeration, and cold storage and freezing rooms.

Frozen foods, \$662,877—covering quick-freeze equipment, low temperature bulk storage, and retail low-temp storage cabinets.

FOOD PACKAGES

WPB has come to the aid of the nation's housewives by formally recognizing them as being eligible (under Order L-239) to receive paperboard boxes for use in frozen

food lockers. In originally issuing the order, WPB restricted the manufacture of boxes for retail sale as empty boxes, overlooking the fact that millions of them are made every year for use in locker plants.

CMP-9A

WPB has clarified the provision covering the amount of copper wire and cable that refrigerator repair men and others operating under CMP-9A may purchase. Misunderstanding about these provisions has resulted in the sale of a great deal more copper wire and cable for repair purposes than was intended.

Repairmen may buy up to \$150 worth of wire or cable (or one-eighth of their 1941 purchases) every three months, whichever is the larger. It may be used for maintenance and repair work only, since additional wire is permitted under certain conditions for connecting-up purposes and re-conditioning work.

Wire may not be bought, however, under the provision of the order which allows up to 500 pounds of alloy brass mill and foundry products per quarter. This is to be used for

such materials as rod, sheet, and strip, pipe, and tubing.

WPB also suggests that repairmen extend ratings of their Schedule I and II MRO customers for replacement of materials used in repairs for these firms, saving the materials obtained through the V-3 CMP-9A symbol for civilian repair work.

SMALL MOTORS

REPAIR shops needing standard model, rebuilt fractional horsepower motors for replacement purposes may obtain information on where they may be available by writing to W. T. Wessels, Used Motor Section, WPB, Temporary "E" Building, Washington 25, D. C. That office receives reports on used motor sales and deliveries, and maintains records on current stocks in the hands of used motor outlets.

Currently, unfilled orders for small motors amount to more than 10 months at present production level, as far as civilian use is concerned. To partly offset this backlog, WPB recently approved an expansion of \$550,000 by General Electric for the manufacture of fractional horsepower AC motors, utilizing labor released from a cutback in Navy equipment.

FREON STILL SHORT

USE of other refrigerants, such as methyl chloride, sulphur dioxide and ammonia, in place of Freon-12 must be continued until the Freon situation improves, the most recent amendment to Order M-28 provides. This time it is an unexpected shortage of anhydrous hydrofluoric acid, a component of Freon, that is causing the delay.

New Freon facilities had been completed that were capable of producing, together with existing plants, a total of about five and a half million pounds of the refrigerant per month. This would have been enough to meet all known military and civilian requirements during the balance of the year.

Shortage of hydrofluoric acid, however, makes it necessary to operate the Freon facilities at less than 70 per cent capacity, so that present restrictions on its use in air conditioning, for example, must be continued for the time being. Of the 1,060 tons of hydrofluoric acid promised Freon-12 producers for October, only 685 tons were available.

VIRGINIA REFRIGERANTS


—"SULFUR"

—"METHYL"

—"METHYLENE"

*Tested Purity
for
Service Surety*






AGENTS FOR KINETIC'S
"FREON-12" and "FREON-22"

VIRGINIA SMELTING CO.

WEST NORFOLK, VIRGINIA



SEALS . . .

Continued from page 35

the shaft, being packed with a synthetic rubber ring, on which pressure is exerted by a metallic washer and spring. The revolving face is forced against the stationary face by the same spring tension. These seals are not expensive, and are very satisfactory for field installation. They are used in some cases as original equipment. This type generally is not recommended for use on a pitted or ground shaft, nor on systems where the lubricant is so viscous that it prevents the rotating part from moving back and forth on the shaft.

It must be borne in mind that each seal was made to fit a certain application. The distance between the shaft-face and the face of the retainer-plate is important. If a shaft is ground, it is necessary to compensate for the amount removed, by putting a washer equal to this amount between the seal-face and the spring. It is not advisable to install a replacement-facing on a shaft without moving back the whole seal and

spring assembly a distance equal to the thickness of the replacement-facing and synthetic rubber washer.

When a seal is removed from a

available, it is advisable to take the compressor to the shop, remove the shaft and proceed in the following manner.

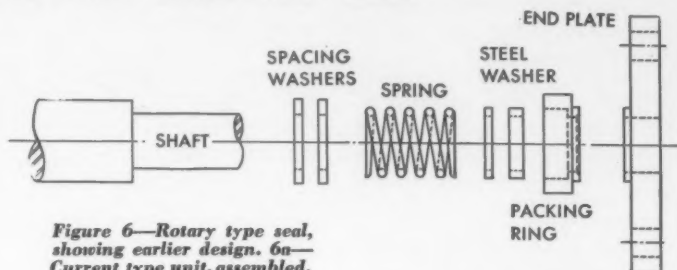
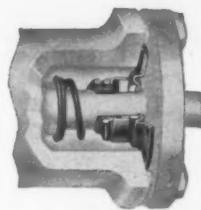


Figure 6—Rotary type seal, showing earlier design. 6a—Current type unit, assembled.

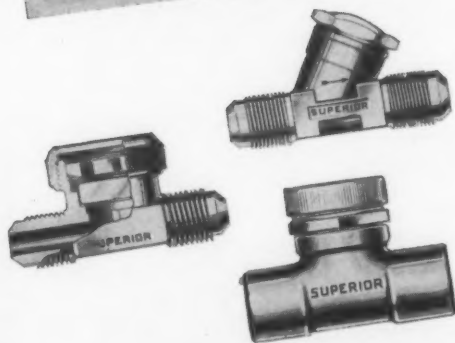
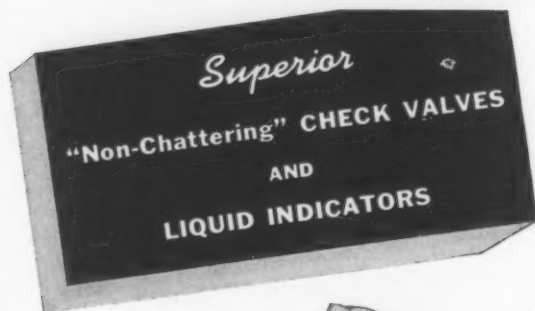
compressor in the field, it is first necessary to be sure that there is no replacement-facing on the shaft. If there is, it must be removed, since there is no way of determining whether the face is turning with, or merely on, the shaft, or whether the synthetic rubber washer is intact. If the shoulder of the shaft is deeply ridged, but the shaft itself is not pitted, bent, or eccentric, it is usually advisable to use a rotary or a factory replacement type of seal. If none are



Treatment of Shaft

Shafts are hardened, and cannot be turned with ordinary equipment. They can, however, be ground between the centers of a lathe, by using

Continued on page 48



No. 112

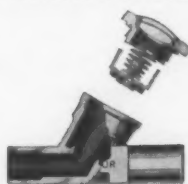
SUPERIOR VALVE & FITTINGS COMPANY
PITTSBURGH 26, PENNSYLVANIA

OFFICES IN PRINCIPAL CITIES • WEST COAST STOCK, LOS ANGELES (15) • JOBBERS EVERYWHERE

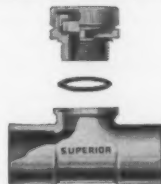
SUPERIOR CHECK VALVES—unique design, positive acting, spring-operated—cannot chatter, hum or buzz under any normal operating conditions. Pressure drop is negligible. Install one in the suction line of each low temperature circuit of all low temperature jobs—your assurance of maximum performance and trouble-free operation.

SUPERIOR LIQUID INDICATORS—call them liquid indicators, sight glasses, or refrigerant shortage detectors—one should be installed in the liquid line of each system. Seal cap over sight glass is double assurance against damage and leaks.

Note these exclusive features



The novel design of these SUPERIOR Check Valves permits the easy removal of all internal parts—as a unit—while soldering lines to valve connections, or for subsequent inspection.



Entire upper assembly of SUPERIOR Liquid Indicators—in all sizes—may be removed as a unit to preclude damage by heat while soldering lines to body connections.

If you haven't a copy of Catalog R2, request one today

temperatures of 100°F. are prevalent. The greatest difficulty was with moisture in the systems. This was due to a large supply of refrigerant that was received containing a considerable quantity of moisture. To overcome this condition dryers were installed, but the moisture content was so great that the chemical agent soon became hot and had to be replaced. When the dehydrating agent refill supply became exhausted, calcium chloride was used, with moderate success.

Another source of trouble was that some types of compressors were operating at too high a speed. High head pressures and constant overloading caused breakdowns. There were also a considerable number of domestic units in this area used by civilian personnel working on construction and other defense projects. These units, of the hermetic type, had to be serviced regularly. Owing to excessive head pressures and improper condenser ventilation, considerable difficulty was experienced when vibration caused suction and discharge lines to break at the unit body. Cor-

rections were made by bracing the lines on all units. Until correction of the source of current was made, 25-cycle current was used to operate the units, causing motors to run hot continuously. Replacement belts of synthetic material soon wore out under these severe conditions. Replacement parts of improved design were received, some of which did not fit properly and were not accompanied with installation instructions. Unavailable parts were made by hand, or on a lathe when one was available.

In the Aleutians, excessive humidity caused frost constantly to build up on the evaporators, and required close attention. In India, some refrigerated warehouses were constructed of mud bricks and straw used as insulation—due to the shortage of insulating materials.

In many of these theaters, bombing and strafing by enemy aircraft required the refrigeration mechanic to be always on the alert. But, despite all handicaps, the refrigeration of perishables continued. Temperatures were maintained from 35°F. for fresh foods to -10°F. for frozen foods. Ice cream freezer maintenance was also included in the routine of refrigeration service.

As the majority of Army refrigerated storage installations in the United States are operated by civilians, the men attending the Camp Lee Quartermaster course are trained for field work. Selected for their reasoning ability and mechanical skill, they are enrolled in the refrigeration course, after they complete basic military training. There they receive theoretical and practical instruction in all phases of refrigeration and its use in the Army.

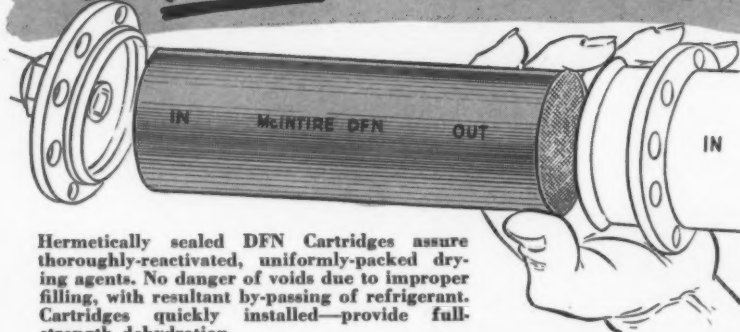
The first two weeks consist of classroom instruction. Here men who have had previous mechanical experience refresh their theoretical knowledge of refrigeration; those who have had no previous experience are given the basic knowledge. Many who have been service men in civilian life, especially those who worked on domestic units, and learned refrigeration by the apprentice method, are now taught the reasons for various adjustments and corrections they made in civilian service. Many of the men become acquainted with the relationship between temperatures and pressures for the first time. Included in these two weeks is instruction in the theory of ice making, and a trip is



PARTIAL PROTECTION?

When refilling dehydrators with bulk drying agents, moisture is rapidly adsorbed from the air—dehydrating capacity is reduced—packing is loose and non-uniform.

OR FULL PROTECTION!



Hermetically sealed DFN Cartridges assure thoroughly-reactivated, uniformly-packed drying agents. No danger of voids due to improper filling, with resultant by-passing of refrigerant. Cartridges quickly installed—provide full-strength dehydration.

The DFN System gives **FULL** protection from every angle—because it is the **only** system that safeguards three ways! A DFN Cartridge dehydrates, strains and filters, and neutralizes.

DFN Cartridges are mechanically packed with the correct quantity and density of reactivated drying agent for dehydrating and neutralizing. An exclusive anti-sediment assembly covers

the **complete area** of the outlet with multiple layers of wire mesh, bronze wool and felt . . . holds more sediment without pressure drop . . . filters to minute size.

DFN demountable assemblies are available from 1 H.P. to 30 tons, with a large safety factor. Ask your distributor—or write us for details.

McINTIRE CONNECTOR COMPANY
NEWARK 5, NEW JERSEY

Only the

DFN

SYSTEM

DEHYDRATORS • STRAINERS

DEHYDRATES
FILTERS
NEUTRALIZES

FILTERS • NEUTRALIZES



During field training students are responsible for operation of equipment.

made to the nearby civilian ice plants.

After finishing two weeks of classroom work, students enter the shop to spend a week learning the proper methods of bending, flaring, swedging, soft and silver soldering copper tubing. Of this week, two days are confined to learning and practicing welding and brazing.

The fourth week is devoted to the explanation and setting up of various types of temperature and pressure controls. This is accomplished by the use of a control panel, on which are located the various types of controls that are likely to be found in Army refrigeration equipment. The controls are operated by a 1/2-horsepower Freon condensing unit. Several types of expansion valves, each of which may be isolated from the system, are connected to a bare pipe evaporator equipped with thermometer wells. Parts of the evaporator are composed of plastic tubing, so as to make possible observation of the refrigerant flow. Expansion valve adjustments are made, students observing the various effects of superheat. Other control adjustments demonstrated include the charging of thermal bulbs.

The fifth week consists of the practical application of compressor repairs, lapping seals, testing for leaks, discharging and charging systems, electrical difficulties and corrections, wiring diagrams, and similar subjects. In each class, emphasis is placed on the application of repairs in the field, using the least amount of spare parts and equipment possible.

Starting with the sixth week, stu-

dents are placed "on their own." They are divided into groups of three and given a space with a one-quarter horsepower air-cooled condensing unit using methyl chloride as refrigerant, and a jumble of tubing, controls, and other equipment. Their job is to use these parts, size them properly, and assemble them so that the unit will produce efficient cooling in the box connected to the unit on which they are working. Scrap tubing is used, and a liquid or suction line may contain as many as 10 soldered swedge joints.

When the unit is completely assem-

bled, a drum of refrigerant is issued. The drum may contain a large quantity of oil, or may be full of moisture; perhaps dirt may be present. These conditions are not made known to the students, and many awkward situations arise. Many an experienced man has been fooled by taking for granted that the refrigerant is in good condition; but, as all these conditions may exist in the field, the problems encountered prove of great practical value.

When this situation has finally been cleared and the unit is operating sat-

Continued on the next page



HERE'S HOW...

Temprite Cooling Units Assure Cold Drinks In Your Beverage Dispensing Machine



YOUR COLD DRINK IS RIGHT WITH TEMPRITE—To better acquaint your engineering staff with Temprite Products and how they can be applied to your dispensing machine, we invite you to correspond with our sales department today.

Manufacturers: You'll certainly want to investigate Temprite Cooling units before deciding on postwar design of your beverage dispensing machine.

"Temprite" units are designed specifically for the dispensing of carbonated and non-carbonated bulk beverages in both automatic and manually operated beverage dispensing machines. Their compact size, large capacity and close temperature control make these units ideal for self contained beverage dispensing systems.

Temprite cooling units are extremely flexible in application and many unique and highly advantageous arrangements can be obtained with their use. Precooling water for use in automatic carbonators is one of many successful arrangements now in operation.

Temprite engineers are ready to cooperate with manufacturers in the design and production of special cooling arrangements, carbonators, dispensing faucets, and other equipment required for new style cabinet assemblies.

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous



Liquid Cooling Devices

41 PIQUETTE AVENUE

DETROIT, MICHIGAN

isfactorily, the student is again "plagued." The units are left operating at the end of the day and before he returns the next morning the instructors again confuse the systems, placing restrictions in the lines, shorting the electrical hookup, allowing air to get into the system, and placing various particles under the suction or discharge valves.

During this entire period the students are left to think for themselves, and only when they are completely baffled will the instructor aid them in finding the difficulties by logical reasoning. This proves to be one of the most interesting weeks, for it puts into actual practice all that has been learned in the previous training.

The seventh week is confined to the operation and maintenance of mobile and portable equipment, consisting of several mobile refrigeration trailers and a portable storage unit located outside, adjacent to the school. Here each student is taught how to adjust, repair, trouble shoot, and time the gas engine which operates the compressor. Temperatures are maintained, and each student is required to service each type unit over a short

period during which he must completely rewire and time the gas engine.

The eighth and final week is spent in maintaining a 3.6-ton ice plant, powered by a 5 x 5 ammonia compressor. During this week the compressor is torn down and inspected, each student being required to operate the plant. Ice is made daily and distributed to various parts of the camp. Ice pulling, brine treatment, and testing is performed by the student.

At the end of each week, the student is given a test covering everything that took place previously, and any student who fails is required to make up the subjects on which he is below par. Additional instruction is given when necessary. After all the grades and individual records made by each instructor during the training period have been tabulated, a final grade is given, taking into consideration previous civilian experience and background.

After leaving the school, students go to a two-week bivouac area in the field. There they operate mobile and fixed units under simulated combat conditions, actually being respon-

sible for food kept in these units for troops in the same area who are receiving training in other Quartermaster activities. Upon return to the camp they are then assigned to units according to their respective skills, and move to the various theaters of operation.

In viewing the thousands of men who have passed through the course, reports show the individual who makes the best student and refrigeration man is the one who has had several years of experience, is willing to learn, accept new ideas and try them, and who is between 27 to 32 years old. Younger men are impatient, and older men have definite ideas and do not accept new methods without some reluctance. As most of these older men have had to learn by practical experience, they hesitate to accept theoretical explanations.

When the war has been won, and Army refrigeration men return to civilian life, they will be a great asset to the refrigeration industry. With their Army experience as a background, these men will be able to meet and solve many service difficulties.

CONTRACTOR MOVES

McGarrey-Greger, Philadelphia refrigeration contracting firm, has moved to new showrooms and offices at 2524 N. Broad St. The company is expanding its activities to include merchandising of Fleetwood commercial cases, as well as household refrigerators, home freezers, and package-type air conditioners.



Picture of what a refrigeration service man feels like when he's trying to keep up with his hot-weather calls. In one Midwestern city, almost 7,000 calls were received by a central bureau over one warm week-end—10 days' work for every qualified man in the town.

DOLE

Vacuum

COLD PLATES

Maximum Refrigeration Efficiency

for all

REFRIGERATION

PURPOSES

DOLE REFRIGERATING COMPANY

5910 N. Pulaski Road, Chicago 30, Illinois

N. Y. Branch: 55 West 42nd Street, New York City 18, N. Y.



JOE ASKIN

Joe Askin, Chief Engineer of Fedders Manufacturing Company for the past 21 years, has joined Peerless of America, Inc. of Marion, Indiana.

With his staff of engineers he is now in the process of redesigning Peerless products and is working



100% on post-war plans. Mr. Askin has had about 35 patents granted on heat transfer surface, refrigeration apparatus, and air conditioning equipment. Since 1928 he taught refrigeration and air conditioning to the night school classes at Seneca Vocational High School, Buffalo, New York.

A. A. KUCHER

A. A. Kucher, director of research of Bendix Aviation Corporation and chairman of its long-range planning committee, has been elected a vice-president, it was announced by Ernest R. Breech, president.

Mr. Kucher is head of the corporation's central research laboratories in Detroit and has charge of investigating and developing new product activities and new business opportunities for Bendix through the long-range planning committee's work.

WILLIAM GOODMAN

William Goodman, consulting engineer for the Trane Company in La-Crosse, Wis., and designer of important air conditioning equipment, has been appointed research professor of refrigeration and air conditioning at

Illinois Institute of Technology, it has been announced today by President Henry T. Heald. Conducting both undergraduate and graduate courses in air conditioning at Illinois Tech, Goodman will also carry out research studies and experimental investigations in this field. Illinois Tech's air conditioning laboratory, which includes three experimental units, will be expanded for his use.

WILLIAM G. HILLS

Mr. William G. Hills, former member of the staff of the Electric Institute of Washington (D.C.) has returned to that organization to replace Joe Doyle, who left on September 1 to become associated with a local distributor of electrical appliances.

RICHARD N. MEYER

Richard N. Meyer has been appointed field manager of the St. Louis territory of Alco Valve Com-



pany. The territory includes the entire states of Kansas, Missouri, Arkansas and Kentucky. Also included are southern Illinois, southern Indiana and the western portion of Tennessee. Mr. Meyer has been manager of Alco's service department for the last two years.

H. A. GORMAN

H. A. Gorman has been appointed Chicago district manager for the industrial department of Wood Conversion Co., as part of an expansion resulting from new products and addi-

tional production capacities of various types of insulation and felt.

Mr. Gorman was transferred to the industrial department from a sales supervisory position in the retail lumber dealer division. New industrial department products will include special insulating fibers for refrigerators and freezers and a patented insulating fiber for lockers and cold storage plants.

LEO R. KILEY

Leo R. Kiley has been appointed Detroit District Engineer for the Vilter Manufacturing Company, with



offices in the Donovan Building, Detroit, Michigan.

For seven years previous to his recent appointment Mr. Kiley was in the Application Engineering Division of Vilter where he was engaged in the layout and design of air conditioning systems, freezing plants and general refrigeration for breweries, dairies and chemical industries.

W. E. KRESS

William E. Kress has been appointed sales manager for Philco Corp. in the middle west territory, with headquarters in Chicago. He succeeds John M. Otter, who was named sales manager for the home radio division.

N. E. BURDETTE DIES

Nathan E. Burdette, 46, secretary-treasurer of Refrigeration Supply Co., Inc., Washington, D. C. refrigeration parts jobber, died Sept. 3. Death was due to coronary thrombosis.

Well known in the refrigeration and electrical industry, Mr. Burdette at the time of his death was treasurer of the Electric Institute of Washington and chairman of the publicity committee of the Baltimore-Washing-

Continued on page 50

**Proven
Pittsberg
Products**

**SULPHUR
DIOXIDE**

**METHYL
CHLORIDE**

**METHYLENE
CHLORIDE**

**Proven for
uniformity, and
low moisture
content**

Your inquiries on other
chemicals are invited

**PITTSBERG
CHEMICAL CO.**

3100 East 26th St., Los Angeles 23, Cal.

SALES AGENTS FOR:

**KINETIC CHEMICALS
FREON 11-FREON 12
FREON 22**

Over the COUNTER

Most of tomorrow's troubles aren't so tough,
once you've taken a real good look at them

FRANK: You know Joe Smith—always looking ahead, trying to spot trouble a mile away? Well, I ran into him out on a job today, and he got talking about the future.

His business is going great guns, and he's making plenty of dough, but the future looks pretty black to him. He says everybody's talking hermetics, and he's beginning to wonder where that leaves him, if everything is going to be hermetics after the war.

JIM: Yeah. Several of the boys have talked to me about the same thing. A lot of stories seem to be going the rounds. Some of the guys go so far as to say all compressors will be hermetic after the war. Every time a story like that is repeated it gets worse. Somebody'd better back off and come into this thing with a clear head.

FRANK: Right you are, Jim. When Joe started weeping today I told him that even if all new machines are hermetic, they'll still be enough conventional type machines in service to keep him and the rest of the men busy for the next ten years. Ten years ago everyone said sulphur was all through as a refrigerant,—but today we're selling as much as we ever did.

First of all, as I see it, there will be only a very few manufacturers, if any, who'll make a complete line of hermetics in commercial sizes. I admit the hermetic looks attractive to fixture manufacturers putting out packaged goods, particularly in the quarter and third and even the half horsepower sizes. Hermetics in these sizes are small, light and compact, just right for installation in a small compartment in a fixture. And they'll be easy to change if they go bad. Some manufacturers are planning to bring out semi-hermetics in small unit sizes. The semi's have all the good talking points of the full hermetics from the customer's point of

view—and can be serviced in the field by a service man. Most of them lend themselves to complete service reoperation in the field, just like conventional units.

JIM: Did that make Joe feel better?

FRANK: Yeah, it gave him a lift. He hadn't looked at it that way before. I said to him, "You and every other service man worrying about the postwar hermetic bugaboo have got to realize that you can have a lot of influence on future trends. Many service men will make a connection with manufacturers to replace full hermetics in the field and sometimes do pretty well that way. Others will both sell and service semi-hermetics. And some guys may set up shops under manufacturers' supervision, to service full hermetics on a local or regional basis."

JIM: That sounds like sense to me. No matter what changes come along, there is always plenty of opportunity for the man who looks ahead and has the courage and ambition to go out and do a real job. And it's a fact that the serv-



ice man can influence future trends. Many prospective buyers of new equipment turn to their regular service man for advice, and act on his recommendations when they buy. So the service man gets plenty of opportunity to talk of the advantages and merits of semi-hermetics, for example.

FRANK: That's it. I told Joe I thought most manufacturers will continue to make conventional type machines in three-quarter horse and up, and the business on these larger units should be bigger and better than ever. By that time, Joe was looking a little sheepish, and admitted he had got himself all worked up without much reason. He said he thought he'd inject a little of his own viewpoint from now on.

JIM: We're going to have to set a lot of Joes straight from now on, I guess. It's part of our job to keep the boys clear in their own minds on postwar prospects.

FRANK: And I'll bet my last dollar that every service man who wants to work will have all the work he can do in the postwar period—hermetics or no hermetics.

JIM: By the way, Charlie was in yesterday and the subject of Pete's trouble with the two horse job and the two blowers he installed at the packing plant came up. Charlie says, "I think I know what caused some of Pete's trouble. If you can't reduce the pressure, you can't reduce the temperature. So if one coil works all right and the two together don't, you can make the two one by a method I've used. When the machine saturation point is licked by high low-side pressure and equivalent high head—assuming a two horse is used and a larger one is indicated—locate the thermal bulb on only a third of one coil and do the same with the other. And then open the valves until the liquid reaches the suction outlets of the coils."

Charlie calls this an elongated dryer coil. He says he's done it with a lot of jobs and it gives peak performance to valve, coils and compressor. While we were talking, up came your friend Jack. He listened for a minute and then suggested the job might be short of liquid. He said that if it was his job he'd put a sight feed indicator in the liquid lines to see if both coils were getting a full requirement of refrigerant.

FRANK: Well, with all the fellows offering suggestions on his job, it looks to me like Pete will soon find

his troubles licked. These refrigeration men are all good guys, when it comes to giving the other fellow the benefit of what they've learned about beating some tough problems. They figure they never lose by sharing their experiences—after all, they'll be needing help themselves one of these days.

SILICA GEL AGAIN UNDER WPB CONTROL

Because of heavily increased military demands for the desiccant grade of silica gel for the moisture-proof

packaging of war materials sent to combat areas, WPB has placed the chemical under Order M-300, the general chemicals order. War-developed uses have caused the industry to expand from its former production average of 500,000 pounds a year to its present output of 60 million pounds annually.

Silica gel has been in free supply since early in 1943, when the previous controls were removed. Under present restrictions, limited supplies will be available for essential refrigeration and air conditioning needs.



NIBCO WROT Fittings are formed in one step from straight copper tubing. They are strong, light in weight and dense in structure . . . impervious to gases. Because every fitting is perfectly formed and absolutely "round and square," they are easier to use in production. Laboratory Control and individual plug testing assure close tolerances. You can eliminate service troubles by using vibration-proof and corrosion-proof NIBCO WROT Fittings. Write for complete catalog.



NORTHERN INDIANA BRASS CO.

ELKHART, INDIANA

VALVES AND FITTINGS SINCE 1904



Electrimatic Regulating Valves

Automatic control and regulating valves for Freon, Methyl Chloride and Ammonia. A large variety of sizes and types available for practically any refrigeration requirement.



WL water regulating valves for Freon, Methyl, or Sulphur. $\frac{5}{8}$ " orifice and $\frac{3}{4}$ " FPT. Brass body construction. Large capacity—no chatter.

WP water regulating valves are available in $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " FPT sizes. Brass body construction for Freon, Methyl or Sulphur. Easy adjustment.



WK water regulating valves are De Luxe Pilot Operated Modulating valves. Iron body, simple adjustment. Available in sizes ranging from $\frac{3}{4}$ " to 2" FPT.

WR regulating valves for Ammonia are diaphragm operated and highest quality corrosion resistant materials are used. Available in sizes ranging from $\frac{3}{8}$ " to 2" FPT.



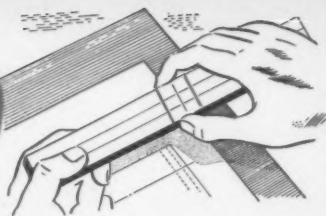
Electrimatic valves are individually tested for efficient, economical operation. Trouble free performance.

Ask for a copy of our latest catalog today.

Electrimatic

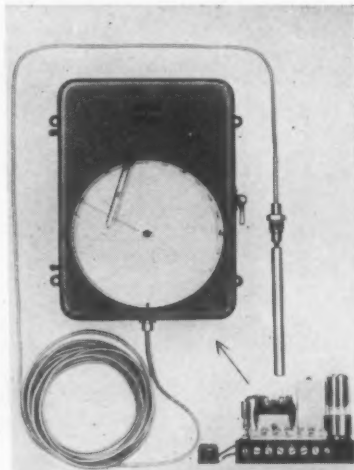
2100 INDIANA AVENUE
CHICAGO 16, ILL.

New PRODUCTS



Automatic Control

A new electronic-type controller has been announced by The Bristol Company, Waterbury, Connecticut. The controller operates on the shielding effect of a vane passing between two coils in an electronic circuit. Recording and indicating models are



offered for automatic control of temperature, pressure, liquid level, and humidity.

The new controller for temperature is offered in ranges from -125° F. to $+1000^{\circ}$ F.

A pressure controller is available in ranges from full vacuum to 6000 pounds per square inch and in addition is available for automatically controlling liquid level. The humidity controller operates from a wet and dry bulb type of element with separate control for each bulb.

Thermostat

A sensitive, wide range, accurately calibrated thermostat for air, liquid and hot plate applications has been introduced by United Electric Control Co., Boston. The instrument is made in two ranges: -100 to plus 100° F., and 50 to 600° F. Entire thermal assembly, including bulb, capillary connecting tube and bellows, is solidly liquid filled and has a uniform expansion per degree change in tempera-

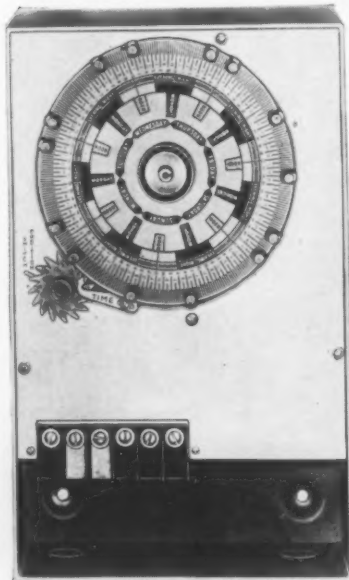
ture. This is said to enable the use of micrometer adjustment and to give the advantage of wide range calibration.

Micrometer type adjustment is calibrated for both Fahrenheit and Centigrade, and calibration accuracy as close as 2 per cent is claimed. The thermostat is said to give control within a total differential of 1° F. in mechanical convection type ovens and 0.2° F. in liquid baths.

The unit is made in three models: oven control thermostat, liquid temperature control model, and indicating controller model for ranges.

Dial Time Switch

A new development in time switches is the Paragon 700 Series 7 day calendar, dial time switch. This unit is used for timing automatic heat, ventilating, lighting, pumping or flushing operations. The switches are equipped with 6" calendar dials



which make one complete revolution every 7 days. Dial trippers can be independently set for different daily ON and OFF schedules. Settings can be made in advance for an entire

week. Any day or days operations may be omitted entirely on a pre-set program. Operations from ON to OFF or from OFF to ON can be set as close as three hours apart and can be separately adjusted throughout each 24 hour day in the week.

Metering Valve

A new metering and automatic waste valve for water supply lines to unheated areas, especially to spray nozzles, has been announced by Alco Valve Co., St. Louis. The new type valve provides two services in one compact assembly—it offers an automatic drain to prevent freezing, and at the same time provides metering means.

Such an arrangement for automatic draining is desirable where spray nozzles on evaporative condensers are located in unheated areas, on supply lines to roof ponds and spray nozzles, and supply lines to outside sill-cocks, etc.

It is ordinarily used in conjunction with a standard solenoid valve which may be controlled by outside thermostats, timers, or any other desired means. Both the solenoid and the metering and automatic waste valve should be installed in a heated area, it is recommended.

Air Conditioning Unit

A wall type air conditioner that removes up to 90% of the latent heat (humidity) with adjustable sensible heat (temperature) is a new development of American Coils Co., Newark, N. J.

Operation of the unit is completely automatic, controlled by a humidistat temperature control and a solenoid valve. The condensing unit is set to defrost automatically on each off-cycle. Since air entering and leaving the unit bypasses the cooling coil, dehumidification is accomplished without appreciable loss of temperature. Cooler temperatures are obtained by manual adjustment.

White One-Coat Enamel

Pemco Corp., Baltimore, Md., has announced a commercially successful one-coat white porcelain enamel, known as "Mirac." No special bond or pickling equipment is necessary, it is claimed, and the finished enamel has good adherence and can be fired at 1500 degrees F., resulting in a brilliant, highly opaque finish.

TESTED AND APPROVED

Refrigerants FOR TOMORROW'S REFRIGERATORS



AVAILABLE IMMEDIATELY!

In large measure, the success of your automatic refrigerators depends on the efficiency and dependability of your refrigerants. Refrigerants are the "life blood" of refrigerators!

Ansul Liquid Sulfur Dioxide is an ideal refrigerant for household refrigerators, with a long and impressive record of trouble-free performance.

Ansul Liquid Methyl Chloride is recommended for small commercial units. Its performance record is equally excellent.

Backed by pioneers in the field, Ansul refrigerants are clean, dry and pure. Ansul service is friendly and deliveries are dependable. Phone, wire or write—today!

THIS TECHNICAL BOOK (3rd Edition)

on Ansul Refrigerants is still available. If you do not have a copy, send for one. It's free.



ANSUL
TECHNICIANS ARE
REFRIGERANT-
SPECIALISTS.
CONSULT THEM
ANY TIME!

* REG. U. S. PAT. OFF.

ANSUL CHEMICAL COMPANY
Marinette, Wisconsin
Agents for Kinetik's "Freon-12" and "Freon-22"

SEALS . . .

Continued from page 39

a tool post grinder and a cup-shaped wheel. Light cuts are necessary, and care must be taken not to overheat the shaft or the temper may be drawn. Do not grind off more than is necessary to remove the ridge. When a shaft is between centers, it is very easy to check it for straightness and eccentricity. Shafts can be straightened, and shops who do heat treating are usually equipped to do this work. It is not advisable to attempt this

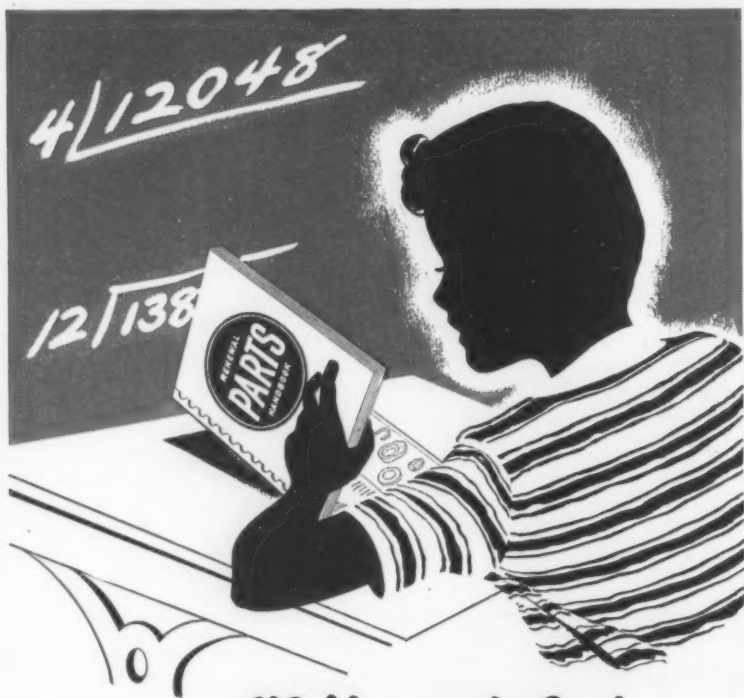
yourself in your own service shop.

A shaft that has been ground in a wet grinder can be used without further preparation. One that has been ground dry, usually has surface scratches, and it is necessary to remove these scratches by polishing or lapping. This can be done by using "Wet or Dry" abrasive paper which has been cut into squares and punched with a hole the size of the shaft. The paper is held against the face of the shaft while it is running in the lathe by a bronze disc, which fits on the shaft, and has an outside diameter slightly larger than the out-

side diameter of the face of the shaft.

Folding back two opposed corners of the square over the disc, and holding it lightly between thumb and forefinger, will prevent it from spinning when it is held in contact with the face of the shaft. This disc can also be used as a lap, and when so used, paper is not necessary. To use it in this fashion, merely dip the face of the disc in light oil and then in abrasive powder, and hold it against the rotating shaft.

This is the first of two articles on various types of seals and how to repair them. The second article will be published next month.



**NO! he won't find
that answer in there -**




Be sure to write
today for your FREE copy

But YOU will find the answer to your Electric Motor Parts Problem!

You'll find the job of maintaining your spare parts stock made incredibly easy with this 136 page catalogue of illustrations, dimensions, and descriptions of thousands of parts for all makes of motors and controllers.

P. S. Best of all—We still ship all orders for stock material the same day they are received!

Not  Inc. PARTS FOR MOTORS, FANS AND CONTROLLERS

complete-reading electric co.

100 S. Jefferson St.—Chicago 6, Illinois

TESTER . . .

Continued from page 27

three tubes tightly together. We then wound 1/4-inch tubing close around the tubes and soldered it to them, with an automatic expansion valve feeding in at the top of the tubing and the bottom being used for a suction line.

By refrigerating this wrapped coil, we were able to secure any temperature desired, from room temperature to -20° F., so that by placing the feeler bulb of the control in one of the inside tubes and a thermometer in the other one, we could observe the exact temperature at which a control opened and closed, and make any necessary changes in the setting.

A small light socket and bulb, with one line attached through the control so that the light burns when control contacts close, enables the repairman to handle other shop work and still catch the temperature readings at which the control opens and closes. By means of a manual switch on the fan, we are able to start it as soon as control contacts open, securing a quick warm-up on the coil to obtain the cut-in reading.

Compressor motor was wired with both thermostatic and low pressure control, so that in testing controls or thermostatic expansion valves the compressor would stop by temperature, and on thermostat controls would be operated by the low pressure control.

All of the parts used in making this testing device were taken from used equipment, and had practically no commercial value. The neon coil cost \$4.50; our entire cash outlay on the whole outfit didn't come to \$10. As a saver of both time and material, however, the unit has been valuable.

ANNUAL ASRE MEETING DECEMBER 10 TO 13

Fortieth annual meeting of the American Society of Refrigerating Engineers will be held in New York City December 10 to 13. Technical sessions will include one devoted to home and farm freezers, at which papers will include: "Home Freezers," by Dr. D. K. Tressler, General Electric Co.; "The Future of Commercial Freezing," by Richard Poole, General Foods; and "The Rate of Freezing Foods in Locker Plants and Domestic Freezing Cabinets," by Prof. J. E. Nicholas, Penn State College.

CARRIER OPENS FROZEN FOODS RESEARCH CENTER

A program of research by Carrier Corporation to develop equipment to serve the frozen foods industry has been announced, together with the opening of the Carrier Frozen Foods Research Store, through which the company will seek to gain a wide variety of experience in the field of frozen foods.

In an open letter addressed "To Our Neighbors In Syracuse", reproduced in the advertising columns of Syracuse newspapers, the company states the purposes of the research program and the general method of operation. The letters says in part:

"Today the new Carrier Frozen Foods Research Store opens its doors. Located at the company's plant, the store will sell retail to our own employees, a wide variety of top quality frozen foods."

Weekly home delivery service of the more than fifty varieties of frozen foods available at the Research Store will be made to owners of home freezers who reside in Syracuse, East

Syracuse, Dewitt, Fayetteville or Nedrow. It was stressed that an important part of the new research project involves acquiring knowledge regarding the requirements of families who have home freezers, and such families are urged to send their names and addresses by mail to Carrier Corporation.

George Meek is director of Carrier's frozen foods research project. In discussing plans yesterday, he announced that Carrier has engaged a graduate home economist, Mrs. Barbara Bornhurst, who will visit owners of home freezers and demonstrate the best ways of preparing and serving frozen foods. On her visits to those who will utilize the weekly delivery service, she will leave copies of a recipe booklet written exclusively for users of frozen foods. Mrs. Bornhurst will also be on hand at the Carrier Frozen Foods Research Store to counsel and advise with Carrier employees who, as the customers of the store, will play an active part in the whole project.

ENTERS HOUSEHOLD FIELD

The Coolerator Co., Duluth, Minn., has announced plans to sell electric refrigerators and home and farm coolers after the war, in addition to ice refrigerators. Formerly the company manufactured ice refrigerators exclusively.

REFRIGERATED BARGES

Mass production of pre-fabricated steel refrigerated barges for use in the South Pacific as floating meat and perishable food warehouses is under way at the National Iron Works, San Diego, Calif. The barges are 104 feet long, 29 feet high, 8 feet deep, and have a cargo capacity of 400 tons. The steel hull is divided into four compartments where 10° F. temperatures are maintained. A daily issue and thaw room is held at 40° F. Four Diesel-driven compressors power the refrigerating system.

FROZEN FOODS COSTS

Frozen foods could be sold as cheaply as those preserved by hot-processing or dehydration methods, if materials were made available for necessary equipment, believes W. R. Woolrich, dean of engineering at University of Texas, Austin, Tex. Speaking before the American Association for the Advancement of Science, Mr. Woolrich said that through recent advances in the art of quick and flash freezing, along with other food tech-

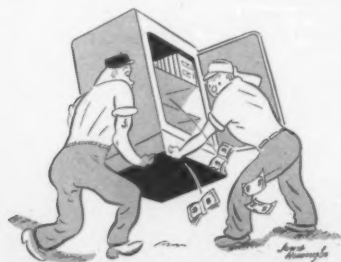
nology developments, "the world's ability to preserve food is now prepared to equal the world's ability to produce it."

NORGE PLANS FREEZER LINE

Norge division of Borg-Warner Corp. plans a wide expansion of its household utilities line when conditions permit through addition of home and farm freezers and unit air conditioners, M. G. O'Harra, sales vice president, has announced. Huge market potentials exist for these products, Mr. O'Harra said, the home and farm freezer market alone being estimated at more than 2,000,000 units within 12 months after production is permitted. Plug-in type room coolers also will increase in popularity after the war, and a wide market is anticipated, he said.

PENN NAMES BUCHEN

The Buchen Company, Chicago, has been appointed advertising agency for the Penn Electric Switch Co. of Goshen, Indiana, manufacturers of automatic controls for heating, refrigeration, pump and air compressor service as well as safety controls for internal combustion engines.



Who says there's no money in refrigerators? Workmen for a used furniture dealer were carrying out a household unit after a recent auction sale in St. Louis, when some curious character opened the door—and out popped \$2,490. The money apparently had been frozen to the coils.

Why the Trend Is Strong to CHICAGO SEALS and VALVE PLATES



Chicago Seals and Valve Plates make a better servicing job on all refrigerators, in less time, at less cost, at more profit . . . and more service men and more jobbers are finding out this fact every day.

CHICAGO SEAL CO.

20 North Wacker Drive, Chicago 6, Ill.

PEOPLE . . .

Continued from page 43

ton section of ASRE. He also was a member of Refrigeration Service Engineers Society and the Washington Board of Trade.

Mr. Burdette's association with the refrigeration field began in 1927 with Frigidaire. In 1933, in partnership with M. J. Trautman, he organized Refrigeration Supply Co.

GEORGE HUGHES DIES

George A. Hughes, 71, founder and chairman of Edison General Electric Appliance company, died recently in St. Lukes Hospital, Chicago. He was known in the electrical industry as "the father of the electric range," having organized the Hughes Electric Heater company in 1910 to manufacture the first commercially sold electric ranges. In 1918 he directed a merger which resulted in Edison General Electric Appliance company of which he continued as president.

WARD R. SCHAFER

Ward R. Schafer has been appointed general sales manager, Edison

General Electric Appliance company. Now regional sales manager of the company's Western region at San Francisco, Mr. Schafer has been a sales and engineering executive in Hotpoint's organization for almost twenty years.



CLARK BRIDGMAN, who has recently organized his own company to handle sales of Bush products in the midwest territory.

W. H. EICHELBERGER

Walter H. Eichelberger has been appointed sales manager for the refrigeration division of Philco Corp., Philadelphia. He has been associated with Philco for the past eight years.

R. S. PEARE

Robert S. Peare, since 1940 manager of publicity and broadcasting for General Electric Co., has been elected a vice president of the company. He will direct General Electric's advertising, broadcasting and general publicity activities.

E. L. SPRAY

Ellis L. Spray has been elected vice president and general manager of Westinghouse Electric Elevator Co., subsidiary of Westinghouse Electric & Mfg. Co.

Mr. Spray's election followed the retirement of Frank C. Reed, who had been president of the Elevator Co. since 1936 and a vice president of the parent company since 1942. In addition to his new responsibilities, Mr. Spray will continue as assistant to President George H. Bucher in charge of the headquarters manufacturing division of the parent company.

R. P. WAITE

Anticipating increased activity in the Southwest, Penn Electric Switch Co., has opened a branch sales office in Dallas, Texas, located in the Wilson Building.



The new office will be managed by Ray P. Waite, a graduate mechanical engineer, who also has had considerable experience in electrical and chemical engineering.

VISOLEAK FINDS 'EM

RED SPOT FURNISHES CLUE TO REFRIGERANT LEAK DETECTION

VISOLEAK is a finely-treated colored refrigerant oil which penetrates every nook and cranny of the system. The leak is indicated by a red stain—similar to the discoloration on a carburetor in which ethyl gasoline has been used. Can be used safely and effectively with any type of refrigerant. See your jobber today. If he has not stocked Visoleak write for complete information.

| WHOLESALE PRICES | | CASE LOTS | |
|-----------------------|---------|------------|--|
| 4 ounce bottle | \$ 1.00 | 48 bottles | |
| 8 ounce bottle | 1.75 | 24 bottles | |
| 1 pint bottle | 3.00 | 24 bottles | |
| 1 quart bottle | 5.00 | 12 bottles | |
| 1 gallon can | 16.00 | 6 cans | |
| SAVE 10% ON CASE LOTS | | | |

WESTERN THERMAL EQUIPMENT CO.

5141 ANGELES VISTA BLVD.
LOS ANGELES 43, CALIF.

AMINCO OIL SEPARATORS



Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from 1/2 H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

AMERICAN INJECTOR CO.
1481 - 14th AVE. DETROIT 16, MICH.

Van D Clothier, 1015 E. 10th, Los Angeles
George Beons, Rm. 730, 1775 Broadway, New York
W. H. Cody, Santa Fe Bldg., Dallas
Export: Borg-Warner, 310 So. Mich., Chicago



ABT AND TZ!

Allied airborne operations, so prominently in the public eye, are being used in

Holland, among other purposes, to vault the districts flooded by the Nazis, as part of a delaying action against our troops. This method of overcoming a water problem in war is just another evidence of resourceful invention and strategic planning.

TZ . . . quick designation for THAWZONE . . . has also been doing its war job in various spots of the world by solving water problems in refrigeration systems. TZ was ingeniously invented and engineered, and has a substantial record of destroying water chemically . . . a record that is recognized and well-known.

"The Moving Dehydrant"

HIGHSIDE CHEMICALS COMPANY
194 Verona Ave., Newark 4, N. J.

THAWZONE
Fully Protected by U. S. Patent
The PIONEER FLUID DEHYDRANT

THE PRACTICAL Refrigeration Engineering MANUAL . . . by Harold Smith

CHAPTER V. Coil Selection

CAREFUL judgment and consideration must always be exercised in the selection of the evaporator to be used on each installation. Evaporators fall into three general groups:

1. Bare pipe coils (which includes plate coils).
2. Cross fin coils (gravity convection).
3. Unit coolers (forced air convection units).

The two principal methods of transferring heat in refrigeration work are:

1. Conduction.
2. Convection.

The conduction method (in which the coil surfaces come in direct contact with the product being cooled) is usually used in applications where the coil is submerged in a sweet water or brine bath, such as water cooling, milk cooling, ice cream making and hardening, ice making, frozen foods, etc. Heat is transferred directly from the product to the coil, resulting in high efficiency and rapid cooling. This is noticeably apparent in milk cooling with an aerator and in freezing products placed on plate coils.

The convection method (in which the heat from the product being cooled is picked up by the surrounding air and the heat in the air is picked up by the coil surfaces) is used in most box, case and cooler applications. Where natural gravity convection is used, the efficiency is considerably less than with conduction cooling. However, with cross fins bonded to the tubes, giving greatly increased surface area, this shortage of efficiency is entirely overcome.

When a motor-driven fan is added to the assembly, we have forced-air convection. The fan drives the air rapidly over the coils, increasing the efficiency to two or three times that of natural gravity convection.

As a means of establishing the efficiency of the various types of coils, a "K" factor is used. This "K" factor represents the number of B.t.u.'s of heat absorbed by 1 sq. ft. of coil surface in one hour to lower the temperature

1° F. Consequently, the capacity of a coil is determined by the formula: Square foot surface x "K" factor x temperature difference. This gives the B.t.u. capacity of the coil for one hour of operation.

In conduction cooling, the high efficiency of direct heat transfer gives a high "K" factor, but as bare pipe or plates are usually used for this method of heat transfer the square-foot area is relatively small, and quite frequently wide temperature differentials must be used to produce the needed capacity. Humidity is difficult to control and is usually very low, when wide temperature differentials are required.

The fin-type coil provides much greater square-foot area, but the heat transfer efficiency is lower, until forced convection is used.

The natural gravity convection-type coil greatly simplifies humidity control, and with proper designing permits the maintenance of high humidity conditions within a refrigerated space, making this type of coil highly desirable in many types of applications where high humidity is needed. These coils are simple in construction, light in weight, and almost entirely free from mechanical difficulties.

The forced-air convection unit has a high heat transfer efficiency, which permits the use of less square foot area. Consequently, it can be made small and compact, taking up very little room in the refrigerated space. Humidity control is somewhat more of a problem. However, by providing enough capacity to operate on a close temperature differential, satisfactory humidity conditions can be obtained.

In large refrigerated areas, with or without duct work, forced air convection can maintain uniform temperatures over the entire area, which would frequently be impossible with gravity convection coils without using a large number of such coils. This would result in an equipment cost considerably out of line, compared to the cost of forced-air convection units.

NATIONAL LOCKER MEETING SETS ATTENDANCE RECORD

Locker operators from 40 states and several provinces of Canada raised to nearly 1,500 the registration lists of the National Frozen Food Locker Association's recent sixth annual convention in Columbus, Ohio.

Products of refrigeration, insulation and other locker plant equipment manufacturers were displayed in some 64 booths. Two exhibitors were refrigeration dealers and service companies who had already built several

complete locker plants. Other refrigeration dealers interviewed explained their presence at the convention by saying locker plant installations are a natural extension of a refrigeration man's operation.

Figures released by the national association show a total of 5570 locker plants now in service in 48 states, approximately 75% of which are in communities of less than 5,000 population, and indicate that postwar construction of new plants will return to the 50-per-month rate of the pre-war period.

Guests who spoke at the three-day meeting included Sen. George D. Aiken (R., Vt.), Dr. Donald K. Tressler of the General Electric Co., and K. F. Warner and S. T. Warrington of the U. S. Dept. of Agriculture.

Exhibitors of refrigeration equipment at the meeting included:

Amana Society, Amana, Iowa; Baker Ice Machine Co., Inc., Omaha, Neb.; Carrier Corp., Syracuse, N. Y.; The Coolerator Co., Duluth, Minn.; Deepfreeze Distributing Corp., Cincinnati; Dole Refrigerating Co.; Chicago; Frigidaire Division, General Motors, Dayton; General Electric Co., Bloomfield, N. J.; Kold-Hold Mfg. Co., Lansing, Mich.; Charles Landrith & Sons, Detroit; Refrigeration Corp. of America, New York City; Refrigeration Service Shop, Inc., Dayton; Stangard-Dickerson Corp., Newark, N. J.; Universal Cooler Corp., Marion, Ohio; York Corp., York, Pa.

COIL "K" FACTORS Bare Pipe—Plate Coils

Natural Gravity Convection:

| | |
|-----------------------------------|------|
| Bare pipe—Temperature above 20° | 1.5 |
| Plate coils—Temperature above 20° | 2.25 |
| Bare pipe—Temperature below 20° | 1.25 |
| Plate coils—Temperature below 20° | 2.0 |

Forced Air Convection:

| | |
|-------------|------------|
| Bare pipe | 2.5 to 6.0 |
| Plate coils | 3.0 to 8.0 |

Submerged in Still Brine:

| | |
|-------------|------|
| Bare pipe | 10.0 |
| Plate coils | 12.0 |

Submerged in Agitated Brine:

| | |
|-------------|------|
| Bare pipe | 16.0 |
| Plate coils | 18.0 |

Finned Coils

Natural Gravity Convection:

| | |
|-------------------------|------|
| 1 row tubes high | 1.2 |
| 2 rows tubes high | 1.0 |
| 3 rows tubes high | 0.8 |
| 4 rows tubes high | 0.7 |
| 5 rows tubes high | 0.65 |
| 6 rows tubes high | 0.6 |
| 7 to 10 rows tubes high | 0.55 |

Forced Air Convection Units

| | |
|--|------------|
| Vary depending on velocity and volume of air | 4.0 to 8.0 |
| Standard unit coolers | 5.0 to 6.0 |
| Standard panel type unit coolers | 4.0 to 5.0 |

When an analysis of the refrigeration field and its requirements are made, a need for all three types of coils can be found, and usually one particular type will prove to be better fitted for a certain job than are the others. For this reason careful appraisal of each job should be made, to insure a wise selection of coils.

Frozen Food Job

1. A frozen food application requires a capacity of 5600 B.t.u.'s. Refrigerator temperature is to be -10° F., evaporator temperature -30° F., a temperature differential of 20°. Plates are to be used with natural gravity convection, which would give a "K" factor of 2.0.

Multiply the T.D. by the "K" factor, (20 x 2.0) equals 40. Divide this figure by the B.t.u.'s required (5600 divided by 40) equals 140, the required sq. ft. surface. A plate 12 in. high by 84 in. long gives 7 sq. ft. surface on each side, or a total of 14 sq. ft. As 140 sq. ft. of surface are required, 10 plates 12" x 84" will provide the capacity needed.

140 (sq. ft.) x 2.0 ("K" factor) x 20 (T.D.) equals 5600 B.t.u.'s.

Meat Service Cooler

2. A meat service cooler requires 6500 B.t.u.'s. Cooler temperature is 35° F., evaporating temperature is 20°, temperature differential 15°. A fin coil and natural gravity convection is to be used. Ceiling of the cooler is low, so a coil not over 2 rows of tubes high is desirable. The "K" factor for the coil would be 1.0.

Multiply T.D. by "K" factor (15 x 1.0) equals 15. Divide this figure by B.t.u.'s required (6500 divided by 15) equals 433, the required sq. ft. surface.

433 (sq. ft.) x 1.0 ("K" factor) x 15 (T.D.) equals 6495 B.t.u.'s.

Brine Coil System

3. A brine circulating system requires 8000 B.t.u.'s. Bare pipe is to be submerged in the circulating brine. Brine temperature is to be 20°, evaporating temperature is -10°, T.D. 30°. The "K" factor for bare pipe is 16.0.

Multiply T.D. by "K" factor (30 x 16) equals 480. Divide this figure by B.t.u.'s required (8000 divided by 480) equals 16.6, the sq. ft. surface required.

16.6 (sq. ft. pipe) x 16.0 ("K" factor) x 30 (T.D.) equals 7968 B.t.u.'s.

NEW JERSEY ENGINEERS ORGANIZE ASRE SECTION

Members of American Society of Refrigerating Engineers who live in New Jersey have organized a Northern New Jersey section of the society. Formal presentation of a charter was made by J. F. Stone, ASRE vice president, at a meeting Oct. 19.

Officers of the section are: H. J. Levins, chairman; A. G. Diell and R. G. Ewer, vice chairmen; W. F. R. Karsten, secretary; W. H. Knowles, treasurer.

MIDWEST JOBBERS MEET

Twenty-eight members of the Midwest Refrigeration Supply Jobbers Association met recently at the Presidential hotel, Kansas City, for a discussion of changes in WPB regulations, deliveries, and future merchandise and supply trends with representatives of 34 manufacturers serving the group. Jobbers from Missouri, Iowa, Kansas, Nebraska, Oklahoma, Colorado, and Minnesota are represented in the association.

Following a general meeting, sectional groups met with manufacturers' men on local conditions and problems.

Otto A. Friemel, Brass & Copper Sales, St. Louis, is president of the Midwest jobber group; A. W. Deitz, Dennis Refrigeration Supply, Des Moines, is vice president, and J. F. Wickham, of Wickham Supply Co., Lincoln, Neb., is secretary-treasurer.



Seabee Bob Stewart, Ex-Servel field man and previously with J. M. Ober, Inc., Detroit jobber, appears to be back at his old job as he looks over a Servel condensing unit used to power an ice cream freezer at an Alaskan island base. The unit is one of several in use on the island.

NORGE MAPS POSTWAR PRODUCT EXPANSION

Total postwar employment in all plants of the Norge division of Borg-Warner Corp. will exceed that of the best peacetime year by 50 per cent on the basis of present plans which call for the expenditure of "very substantial sums" for expansion of production facilities, Howard E. Blood, president, disclosed following a conference in Muskegon, Mich., with Norge officials and parent company directors.

The expansion plans, he pointed out, were made in anticipation of keen competition in the household appliance field "despite expected strong demand."

Norge is prepared to go into limited production of consumer goods even before conclusion of its present war contracts provided the appropriate government agencies cooperate in making labor and materials available as war needs decline, he stated.

Present plans also contemplate the continuation of operations in a Muskegon plant which was acquired at the start of the war for the production of Oerlikon gun mounts. Motor-compressor refrigeration units will be manufactured in this factory postwar.

FARM MARKET CITED

Food freezing equipment looms as one of the most important items in the field of electrical appliances for farm use, L. W. Clifford, sales development manager of the Westinghouse commercial refrigeration department, told a recent conference of public utility officials in Philadelphia.

Frozen food for sale appears to be a good approach to increased farm income, he declared, pointing out that large-size frozen food storage cabinets could either be built on the farm or purchased as ready-made units.

Use of such equipment will enable truck farmers to market their produce at the most opportune time, rather than being forced to dump crops on a glutted market, he said.

PENN BUILDS NEW OFFICE ADDITION

Penn Electric Switch Co. is constructing an addition to its offices at Goshen, Ind. to relieve present congestion and inadequate facilities for

the company's workers. This is the fourth building expansion for Penn since its move to Goshen from Des Moines in 1937. The added space is expected to be ample for both present and postwar needs.

JOBBER GROUP TO MEET NOV. 20-22 IN CHICAGO

Members of the National Refrigeration Supply Jobbers Association will meet at the Edgewater Beach Hotel, Chicago, on Nov. 20 to 22. A full program of meetings and conferences on current problems is being scheduled under the direction of H. W. Small, acting president of the organization.

CHECK ✓ AND DOUBLE CHECK ✓ ✓

Checking concentricity between thread diameter and outside diameter of unit nut—held to close tolerance for proper calibration.



8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action Principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.



Checking form of gear teeth and relation to shaft assembly over entire circumference by exacting comparator method.

IN EVERY STAGE OF PURCHASE AND PRODUCTION COUNTLESS TESTS ASSURE DEPENDABILITY OF WHITE-RODGERS CONTROLS

The accuracy and dependability of White-Rodgers temperature and pressure controls begins when materials enter the factory.

Every part, every assembly is checked and double checked to make sure it will perform the function for which it was designed.

These preliminary tests plus the rigid final inspection of the finished White-Rodgers control are reflected in the performance of your own equipment.

Write for your copy of the White-Rodgers catalog today!



Electrically and mechanically checking spring pressure to assure complete range of control operation.



WHITE-RODGERS ELECTRIC CO.

1225K Cass Ave.

St. Louis, Mo.

CANADIAN AGENTS:
PRESTON PHIPPS, INC., Montreal, Quebec
A. D. PORTER ASSOCIATED, Toronto, Ontario
FLECK BROS., LIMITED, Vancouver, B. C.

Controls for Heating • Refrigeration • Air-Conditioning

The MARKET Place

The net rates for this department are as follows: minimum charge—\$2.00, 25 words. Each additional word, 10c.

Bold type or all capitals: minimum charge—\$3.00, 25 words. Each additional word, 15c.

Box number or address not included in word count. All classified advertising payable in advance.

Address all communications to this department:

**CLASSIFIED ADVERTISING
DEPARTMENT
THE REFRIGERATION INDUSTRY
812 HURON ROAD
CLEVELAND 15, Ohio**

POSITIONS AVAILABLE

REFRIGERATION SERVICE MAN with knowledge of commercial refrigeration, to help develop commercial servicing department in expanding organization. Starting rate 90 cents per hour, plus commission, expense account, and car allowance. Give full details about yourself and your experience in first letter. Box F-53, Refrigeration Industry.

SERVICE MAN for ice cream cabinets. Must be thoroughly experienced with old and new models Frigidaire and Kelvinator equipment. Immediate position with post-war future. Top union scale \$1.25 per hour plus time and one-half over 40 hours. Annual vacation with pay. The Samarkand Company, 893 Folsom Street, San Francisco 7, Calif.

SHOP SUPERINTENDENT. Must have ability to train and handle men. Thorough knowledge of compressor rebuilding, motor repair and general shop practice required. Permanent position, well established organization. Salary \$325.00 per month. Box F-85, the Refrigeration Industry.

REFRIGERATION SERVICE MAN for commercial servicing and sales in expanding organization. Starting rate \$1.25 per hour; plus commission; expense account, and car allowance. Give full details and experience in first letter. Box F-199, Refrigeration Industry.

FRANCHISES WANTED

MANUFACTURERS!

Do you now have authorized service facilities in Boston and Metropolitan area? And if so, will they be satisfactory for the post war business you are planning? If not, now is the time to get set.

Our firm have been service specialists for eighteen years and serve an area of two million people. We are well financed and have competent employees and ample facilities, shop space, trucks, stock rooms, etc. to do a fine job for you. We are familiar with air conditioning, domestic and commercial refrigeration, low temperature applications, including ice cream freezing and food freez-

ing. We can offer complete service from application engineering to warehousing, delivering, installing and servicing on all kinds of refrigeration or other major appliances. We would appreciate an opportunity to discuss the possibility of making our service department YOUR service department.

MILLER & SEDDON CO., INC.
2089 Massachusetts Ave.
Cambridge, Massachusetts

SALES ORGANIZATION desires a profitable connection for the State of Maryland. We are equipped to sell a deep freeze unit to be used in the home. Background:— we have our own building; rated in Dun & Bradstreet's; have 17 years experience. Financially capable of handling any sales proposition. T. K. Sanderson Organization, 200 E. 25th St., Baltimore, Md.—18.

EQUIPMENT WANTED

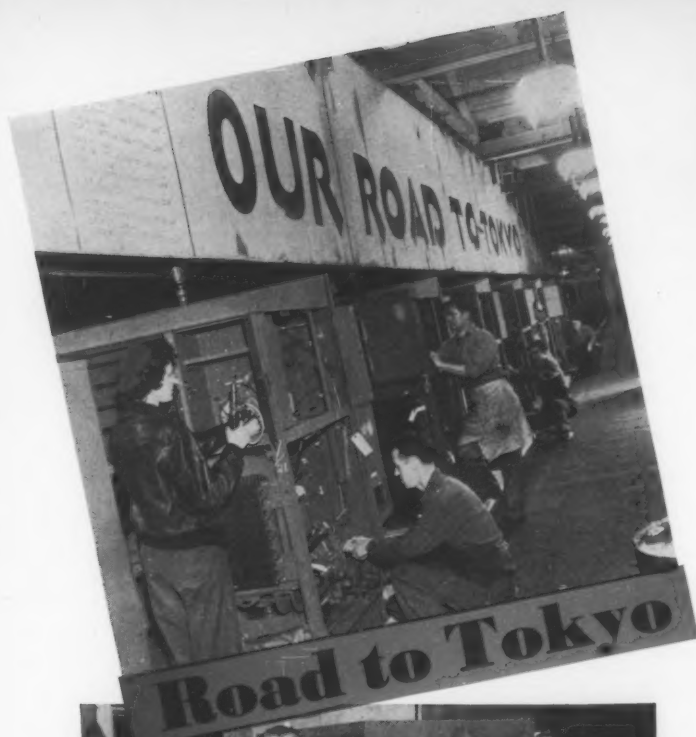
WANTED TO BUY: SURPLUS REFRIGERATION UNITS, PARTS, MOTORS, HOUSEHOLD OR COMMERCIAL. EDISON COOLING CORP., 310 EAST 149th ST., NEW YORK 51, N. Y.

"I want a job"



*Announcing a free
Want-Ad Service
for
returning fighting men*

Beginning at once, with pleasure we are reserving this department for free **POSITIONS WANTED** ads of honorably discharged men and women of our armed forces. *The Refrigeration Industry* reserves the right to edit copy. The ads will run for one issue only but may be reinserted from time to time at veteran's request. **VETERANS:** Send your name, address, service unit and serial number and a description of the kind of job you're interested in (dealerships, sales, service) to Classified Advertising Department "h", *The Refrigeration Industry*, 812 Huron Road, Cleveland 15, Ohio.



Hanging up a new production record for refrigerating units of this size and type, "Production Soldiers" of the Universal Cooler Corp. celebrated completion of the 5,000th unit which recently rolled off the automotive-type production line they call the "Road to Tokyo."

On hand for the history-making 5,000th unit of the "Road to Tokyo" were (left to right above) George Keltner, of Universal Cooler materials control department; Government Inspector K. C. Besse; President F. S. McNeal and Works Manager A. E. Knapp.

Featured in a full page illustration in "Fortune," the "Road to Tokyo"

was designed and built by Universal Cooler engineers to expedite the production of large two-temperature (10 degrees and 35 degrees) refrigerating units. The Army, Navy and Marine Corps use these refrigerating units for giant cold storage warehouses abroad.

More than 325 feet long, it has 18 sub-assembly stations and other refrigeration production innovations. These special units (even to a grueling four-hour test under their own power) are completely wrapped and crated to withstand salt air and sea water when they reach the end of the line within 25 feet of the dock from which they are loaded for shipment to world-wide invasion fronts.



Make a habit of checking door gaskets on every refrigerator you repair...you'll earn more money and do a better service job. Worn or deteriorated gaskets cause heat losses ranging up to 9% on a high percentage of used refrigerators, and cost the owners money.

Jarrow Gaskets for all popular makes of refrigerators conform to original specifications...are recognized as the ideal gaskets for replacement.

Your Jobber Has Jarrows In Stock



"CLEAN-A-COIL"

FOR
DE-SCALING
CLEANING

**WATER COOLED
CONDENSERS,
COOLING COILS,
EVAPORATORS.**

**NOT CLASSIFIED AS
CORROSIVE LIQUID**

*Write for Descriptive Literature
or Consult Your Local
Jobber*

Standard Solvent Co.
CHICAGO



New IDEAS

"Glass plastics"—a combination of molded plastics and glass fibers—may find use in refrigerators and other appliances after the war, it is predicted.

Molded plastic-glass combinations, some of which are now being used in fighter planes, are said to have a tensile strength comparable to steel and an impact resistance 10 times that of ordinary plastics.

Refrigeration may be a principal factor in knocking Japan out of its position as the exclusive producer of silk. Experiments in sericulture—the production of raw silk by the raising of silk worms—in a Brazil experiment station indicate that through refrigeration 10 crops of cocoons can be produced in 12 months.

Such a method of furnishing the low temperatures necessary in the life cycle of the silk worm would work out quite well in Brazil, which has a climate suitable for growing mulberry trees all during the year.

Recent experiments are said to have led to installation of extensive refrigerating rooms in one of the buildings of the station. Other buildings are being equipped with processing, testing and weaving equipment.

A 4-foot refrigerator, using aluminum in both cabinet and compressor construction, is now being used by long-range transports and patrol planes to carry life-saving serums and vaccines, as well as certain foods, to distant theaters of war. Commercial airline men say that in the postwar period similar refrigerators will be useful in preserving food for air transport passengers, as well as for fast shipment of serums and other medical requirements.

The unit takes up less than 3½ feet of floor space, and weighs 106 pounds, net. The motor normally operates on 24-volt direct current, but can be provided to operate on

110-volt alternating current as well, so that the refrigerator would operate from the plane's electrical system when in the air, and from commercial current—when available—on the ground.

Cabinet is made of 22-gauge aluminum, reinforced with aluminum structural angles. The all-aluminum direct-expansion type evaporator has two ice trays, and the aluminum defrost tray clips into place below the evaporator. Shelves and drawers inside the cabinet also are of aluminum, as are the condenser fan (directly connected to the motor shaft) and the finned tube condenser coil.

A new explosive rivet has been developed by engineers for aircraft manufacturing, and can be adapted to use in the making of refrigeration equipment in the postwar period.

This new rivet has a small auxiliary explosive cavity which extends from the main chamber in the shank toward the head, so that the entire shank expands when the charge detonates.

New chemical processes which produce silk and nylon stockings that do not run, wool that does not shrink, blue serge suits that do not get shiny, wool pants that keep a sharp crease, even in the rain, have been developed as a result of wartime research. Other chemicals now in production double the wearing qualities of wool and cotton, make textiles mildew-proof.

Runs in stockings are prevented by treatment with a colloidal substance called silica sol. Deposited on the threads, it makes snagged threads cling together instead of raveling. The same substance puts a lusterless coating on blue serge, and impregnates wool so that it achieves a durable crease when pressed under heat. Available now only for war requirements, the maker promises that eventually the bottled chemicals will be obtainable eventually for home uses.

CENTRAL STATES JOBBERS FORM REGIONAL GROUP

Thirteen refrigeration parts and supplies jobbers from Michigan, Pennsylvania, Ohio and Indiana completed formal organization of the North Central States Group of Refrigeration Supply Jobbers at a meeting Sept. 26 in Columbus, Ohio.

J. H. Downs, of Refrigeration Supply Co., Cleveland, was elected chairman of the organization, with Ned Mason, of Mason Supply Co., Columbus, as secretary.

Member jobbers include: Lifsey Distributing Co., Flint; B. F. Harris & Son, Grand Rapids; J. Geo. Fischer & Sons, Saginaw; J. M. Oberc, Inc., Detroit; Wm. M. Orr Co., Joseph Woodwell Co., and Williams & Co., Pittsburgh; Percy G. Hansen, Akron; Mason Supply Co., Columbus; Allied Parts Co., Dayton; Refrigeration Supply Co., Cleveland; Duncan Supply Co. and F. H. Langsenkamp Co., Indianapolis.

BRASS & COPPER SALES BUILDS WAREHOUSE

Upon authorization by the War Production Board, Brass & Copper Sales Company, St. Louis refrigeration and air conditioning supply jobber, has started construction of large new warehouse space.

The new building will permit the company to relocate some of its metal processing machinery and allow one whole building for storage of refrigeration supplies.

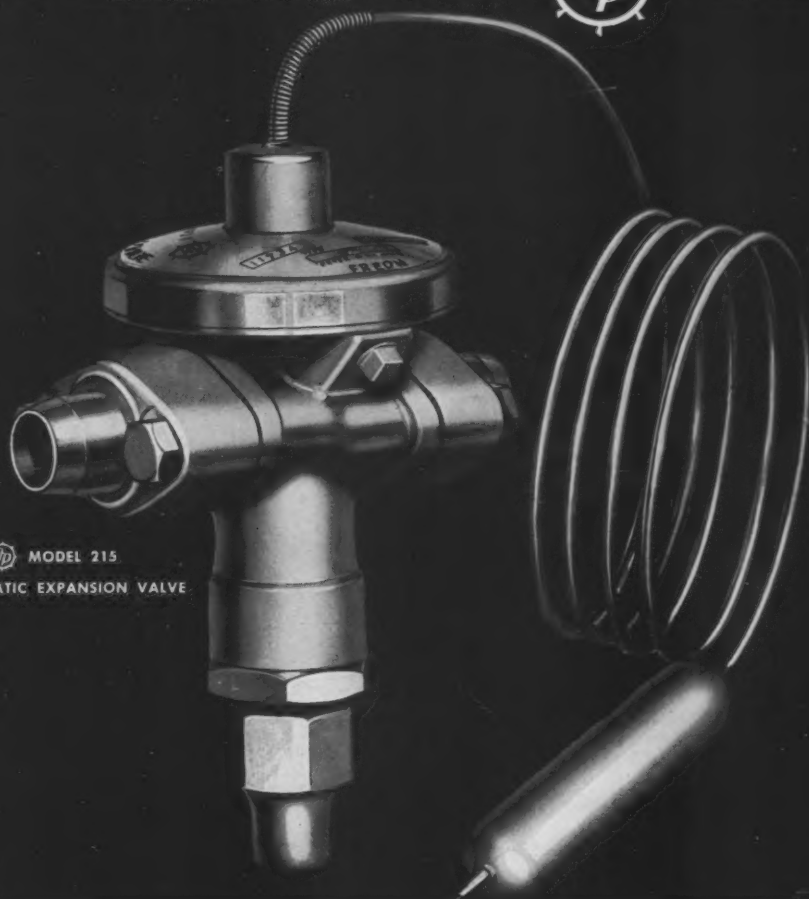


ALL THE COMFORTS OF HOME—On the Normandy fighting front, Lieut. Jack Adam adds something to the ice cubes from the "brand new 1942 Norge refrigerator" which graces the officers' club of the 494th fighter bomber squadron. Adam, a former salesman for the Arnold Wholesale Corp., Cleveland Norge distributor, has no idea "how it got here and how we managed to get it for our bar . . . just a short time after D-Day." In fixing up their club, which is complete with fluorescent lights and radio, the boys got a large tent and built a bar from salvaged plywood and aluminum.



Dependability doesn't happen...

IT'S BUILT INTO EVERY  VALVE



 MODEL 215
THERMOSTATIC EXPANSION VALVE

Designed for large commercial refrigeration and air conditioning applications, Model 215 has a capacity range of 3 to 6 tons Freon, and 6 to 12 tons Methyl or Sulphur. Available with or without equalizer, it is ruggedly built, super-sensitive with its extra large area diaphragm and can be installed in any position. Easy installation, adjustable superheat, simplicity of inspec-

tion and adjustment are other features that add to its popularity among refrigeration engineers. Write for complete bulletin No. 408.

AUTOMATIC PRODUCTS COMPANY

2486 North Thirty-Second Street • Milwaukee 10, Wisconsin
Export Dept. — 13 E. 40th St., New York 16, N. Y.



DEPENDABLE REFRIGERANT VALVES

Stocked and Sold by Progressive Refrigeration Jobbers Everywhere — Recommended and Installed by Leading Refrigeration Service Engineers.

AIR FILTERS—SOLENOID & EXPANSION VALVES

AIR FILTERS

Detroit Air Filters are the replacement type made of corrugated board. Two 45° cross section slices of corrugated board are placed together to make a large number of small air passages, each of which turns at a right angle. The corrugated board is impregnated with a odorless, dust catching compound that remains tacky at 10°F—will not drip at 180°F.

SOLENOID VALVES

Detroit Solenoid Valves are available in a complete range of sizes with capacities to 17 tons Freon at a 2 lb pressure drop. They are designed for service with all non-corrosive refrigerants, water or air and are particularly adapted to refrigeration liquid or suction line applications. Quiet operation is assured by elimination of A.C. hum.

EXPANSION VALVES

Detroit Expansion Valves include both automatic and thermostatic, adjustable and non-adjustable types, capacities up to 20 tons on Freon. The Thermostatic type combines the advantages of single diaphragm construction with the exclusive gas charged power element. Power elements are charged with a fixed, carefully controlled amount of gas.

DETROIT

Railway & Engineering Specialties Limited

MONTREAL

TORONTO

WINNIPEG

